Supreme Court, U.S.
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No. _____

In The

Supreme Court of the United States

OCTOBER TERM, 1997

MARITIME OVERSEAS CORPORATION,

Petitioner,

v.

RICHARD ELLIS,

Respondent.

On Petition for a Writ of Certiorari to the Supreme Court of the State of Texas

APPENDIX

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APPENDIX A

SUPREME COURT OF TEXAS

No. 94-1057

MARITIME OVERSEAS CORPORATION,
Petitioner,

v.

RICHARD ELLIS,
Respondent.

On Application for Writ of Error to the Court of Appeals for the Fourteenth District of Texas

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Argued on November 5, 1997

OPINION

JUSTICE BAKER delivered the opinion of the Court, in which JUSTICE ENOCH, JUSTICE SPECTOR, JUSTICE ABBOTT and JUSTICE HANKINSON join.

JUSTICE GONZALEZ filed a concurring opinion, joined by JUSTICE ABBOTT with respect to Part III only.

JUSTICE HECHT, joined by CHIEF JUSTICE PHILLIPS, filed a dissenting opinion.

JUSTICE OWEN not sitting.

This case involves Richard Ellis's Jones Act claims for injuries he sustained aboard a vessel owned by Maritime Overseas Corporation. The trial court rendered judgment on the jury's verdict for Ellis for actual and exemplary damages and awarded prejudgment interest. The court of appeals affirmed the actual damages award, but reversed the awards of exemplary damages and prejudgment interest.

Maritime asserts that the court of appeals used an improper standard to review the factual sufficiency of Ellis's damages evidence. Maritime also contends that the court of appeals should have applied a *Daubert-Robinson-Havner* review to determine whether any well-founded scientific methodology supported some of the actual damages award.[1] We conclude, under the facts of this case, that the court of appeals properly disposed of Maritime's claims. Accordingly, we affirm the court of appeals' judgment.

I. BACKGROUND

A. Facts

Ellis served as a steward's assistant in the housekeeping and galley department aboard the *S/T Overseas Alaska*, a 700-foot oil tanker owned by Maritime. In late August 1982, while the ship was at sea, the chief steward attempted to control a roach problem by spraying Diazinon, an industrial strength pesticide, in small, enclosed, unventilated areas, including the pantry, a storeroom and other nearby areas. The chief steward did not dilute the Diazinon properly. On the morning after the spraying, crew members noticed a strong insecticide odor. The captain ordered several crew members, including Ellis, to clean up the excess Diazinon. Ellis participated in the cleanup for about five hours without wearing inhalation protective gear or special equipment to protect his skin from contact with the insecticide. He was exposed to Diazinon levels up to 200 times over what is considered safe for human exposure.

After the cleanup, Ellis complained of a headache, eye irritation, and a runny nose. The ship reached New Orleans two days later, and Ellis was sent to the New Orleans General Hospital Emergency Room. At the hospital, emergency room personnel found Ellis had myosis with pupil constriction, muscle twitching, and muscle weakness along

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[1] *See Daubert v. Merrell Dow Pharms. Inc.*, 509 U.S. 579 (1993); *E. I. duPont de Nemours v. Robinson*, 923 S.W.2d 549 (Tex. 1995); *Merrell Dow Pharms., Inc. v. Havner*, 953 S.W.2d 706 (Tex. 1997).

with other symptoms. Ellis's blood tests revealed that he had depressed levels of acetylcholinesterase, an essential enzyme. The insecticide Diazinon is an organophosphate, which is toxic to humans in varying degrees. The emergency room doctor testified at trial that on a scale of one to ten, with one representing normal health and ten representing death, Ellis suffered organophosphate exposure of a level of six to seven. The examining physician concluded that Ellis suffered from Diazonin exposure and gave Ellis medication for eye problems. The examining physician did not hospitalize Ellis, but she recommended follow-up care. About a month later, Ellis saw another doctor for continuing problems with his eyes.

Months after his exposure to Diazinon, Ellis began to complain of memory defects, irritability, gastrointestinal problems, anxiousness, fatigue, indigestion, nausea, muscle pain and stiffness, leg cramps, dizziness, insomnia, high blood pressure, and black-out spells. At trial, Ellis's experts testified that his Diazinon exposure had caused him to suffer from "delayed neurotoxicity" or "neuropathy." Ellis's experts also testified that his condition is irreversible.

B. Procedural History

About ten months after his exposure to Diazinon, Ellis sued Maritime for gross negligence under the Jones Act and unseaworthiness under general maritime law. Based on the jury's verdict, the trial court rendered judgment for Ellis for $8,576,000 in actual damages, $1,000,000 in punitive damages, $1,000,000 in exemplary damages for failure to pay maintenance and cure, and $1,871,728 in prejudgment interest. The damages totaled about $12.6 million. Maritime filed post-verdict motions for judgment notwithstanding the verdict and new trial or, in the alternative, for remittitur. Maritime alleged that the actual and exemplary damages were excessive because the evidence was factually insufficient to support the damage awards. The trial court overruled all of Maritime's motions.

In the court of appeals, Maritime only complained about the trial court's denial of its motion for new trial and motion for remittitur; it did not challenge the trial court's denial of its motion for judgment notwithstanding the verdict. The case was first argued before a three-judge panel of the court of appeals. The panel majority held that the

evidence was factually insufficient to support the damages award. There was a dissent without an opinion. Later, the court of appeals granted Ellis's motion for en banc rehearing. Following argument, the en banc court affirmed the actual damages award, but reversed the trial court's judgment for exemplary damages and prejudgment interest. 886 S.W.2d 780.

This Court granted Maritime's application for writ of error on two issues. First, Maritime contends that the court of appeals erred by not using the proper standard to review the factual sufficiency of Ellis's actual damages evidence. Maritime argues that the court of appeals should have applied a traditional factual sufficiency review to the damage award instead of a featherweight causation standard because the trial court submitted the damages question to the jury based upon a preponderance of the evidence burden of proof. Second, Maritime contends, within the framework of its factual sufficiency review argument, that the court of appeals should have examined whether any well-founded scientific methodology supported the jury's actual damages award.

At oral argument in this Court, Maritime stated that it was not making a no evidence complaint. Rather, Maritime asserted that its only complaint is that the court of appeals did not properly conduct a factual sufficiency review. However, under its factual sufficiency argument, Maritime argues that there is *no evidence* of long term injury from delayed neurotoxicity. In essence, Maritime would have this Court conduct a no evidence review of the evidence about delayed neurotoxicity within the Court's review of whether the court of appeals properly reviewed the factual sufficiency of the evidence. We decline to do so.

II. COURT OF APPEALS' FACTUAL SUFFICIENCY REVIEW

A. The Jones Act 48 U.S.C. § 688

The Jones Act provides a cause of action for maritime workers injured by an employer's negligence. Federal law provides that a party asserting an admiralty action may bring the action in state court. *See* 28 U.S.C. § 1333(1). When a state court hears an admiralty case,

that court occupies essentially the same position occupied by a federal court sitting in diversity: the state court must apply substantive federal maritime law but follow state procedure. *See Texaco Ref. & Mkt. Inc. v. Estate of Dau Van Tran*, 808 S.W.2d 61, 64 (Tex. 1991); *see also General Chem. Corp v. De La Lastra*, 852 S.W.2d 916, 920 (Tex. 1993).

Under the Federal Employers' Liability Act (FELA), a related statute, the causation burden is not the common law proximate cause standard. Rather, the causation burden is "whether the proof justifies with reason the conclusion that employer negligence played any part, even the slightest, in producing the injury for which the claimant seeks damages." *Rogers v. Missouri Pac. R.R.*, 352 U.S. 500, 506-07 (1957); *Landry v. Oceanic Contractors Inc.*, 731 F.2d 299, 302 (5th Cir. 1984). This burden has been termed "featherweight." *See Johnson v. Off Shore Exp., Inc.* 845 F.2d 1347, 1352 (5th Cir. 1988); *Smith v. Trans-World Drilling Co.*, 772 F.2d 157, 162 (5th Cir. 1985); *see also Sentilles v. Inter-Caribbean Shipping Corp.*, 361 U.S. 107 (1959). The Jones Act expressly incorporates FELA and the case law developing that statute. *See Ferguson v. Moore-McCormack Lines, Inc.*, 352 U.S. 521 (1957). Thus, the causation standard under the Jones Act is the same as that under FELA. *See American Dredging Co. v. Miller*, 510 U.S. 443, 456 (1994); *see also Brown & Root, Inc. v. Wade*, 510 S.W.2d 408, 410 (Tex. Civ. App.—Houston [14th Dist.] 1974, writ ref'd n.r.e.).

B. Standards of Review

1. Jones Act Liability

Texas courts have long recognized that in addition to the burden of proof being less stringent, the standard of appellate review in a Jones Act case is also less stringent than under the common law. *See Texas & Pac. Ry. v Roberts*, 481 S.W.2d 798, 800 (Tex. 1972); *Brown & Root, Inc.*, 510 S.W.2d at 410. As with the law on causation, FELA's standard of appellate review applies in Jones Act cases. *See Ferguson*, 352 U.S. at 523. Thus, the purpose of the Jones Act standard of review is to vest the jury with complete discretion on factual issues about liability. *See Rogers*, 352 U.S. at 506-507. Once the appellate court determines that some evidence about which reasonable minds could

differ supports the verdict, the appellate court's review is complete. *See Roberts*, 481 S.W.2d at 800 (citing *Lavender v. Kurn*, 327 U.S. 645 (1946)). Essentially, a Texas court of appeals may not conduct a traditional factual sufficiency review of a jury's liability finding under the Texas "weight and preponderance" standard. *See Roberts*, 481 S.W.2d at 801; *see also Brown & Root, Inc.*, 510 S.W.2d at 410. Rather, courts of appeals must apply the less stringent federal standard of review.

2. Excessive Damages and Remittiturs

Texas courts of appeal have the power to review excessiveness of damages and to order remittitur in FELA actions and, by implication, in Jones Act cases as well. *See Sweet v. Port Terminal R.R.*, 653 S.W.2d 291, 294-95 (Tex. 1983); *c.f.* [sic] *Nobles v. Southern Pac. Transp. Co.*, 731 S.W.2d 697, 699 (Tex. App—Houston [14th Dist.] 1987, writ ref'd n.r.e.); *see also Nairn v. National R.R. Passenger Corp.*, 837 F.2d 565, 566 (2d Cir. 1988). The appellate court must make its own "detailed appraisal of the evidence bearing on damages." *Nairn*, 837 F.2d at 567, (quoting *Grunenthal v. Long Island R.R.*, 393 U.S. 156, 159 (1968)).

The standard of review for an excessive damages complaint is factual sufficiency of the evidence. *See Rose v. Doctor's Hosp.*, 801 S.W.2d 841, 847-48 (Tex. 1990); *Pope v. Moore*, 711 S.W.2d 622, 624 (Tex. 1986). The court of appeals should employ the same test for determining excessive damages as for any factual sufficiency question. *See Pope*, 711 S.W.2d at 624. When considering a factual sufficiency challenge to a jury's verdict, courts of appeals must consider and weigh all of the evidence, not just that evidence which supports the verdict. *See Ortiz v. Jones*, 917 S.W.2d 770, 772 (Tex. 1996); *Lofton v. Texas Brine Corp.*, 720 S.W.2d 804, 805 (Tex. 1986). A court of appeals can set aside the verdict only if it is so contrary to the overwhelming weight of the evidence that the verdict is clearly wrong and unjust. *See Ortiz*, 917 S.W.2d at 772; *Cain v. Bain*, 709 S.W.2d 175, 176 (Tex. 1986). The court of appeals is not a fact finder. Accordingly, the court of appeals may not pass upon the witnesses' credibility or substitute its judgment for that of the jury, even if the evidence would clearly support a different result. *See Pool v. Ford Motor Co.*,

715 S.W.2d 629, 634 (Tex. 1986).

If the court of appeals determines that the evidence supports the jury's verdict, it is not required to detail all the evidence supporting the judgment when it affirms the trial court's judgment for actual damages. *See Ellis County State Bank v. Keever,* 888 S.W.2d 790, 794 (Tex. 1994). On the other hand, when reversing a trial court's judgment for factual insufficiency, the court of appeals must detail all the evidence relevant to the issue and clearly state why the jury's finding is factually insufficient or so against the great weight and preponderance of the evidence that it is manifestly unjust. *See Keever,* 888 S.W.2d at 794; *Pool,* 715 S.W.2d at 635. The court of appeals must explain how the contrary evidence greatly outweighs the evidence supporting the verdict. *See Keever,* 888 S.W.2d at 794; *Pool,* 715 S.W.2d at 635.

Because the question of whether damages are excessive and that a remittitur is appropriate is a factual determination made final in the court of appeals, this Court lacks jurisdiction to review such findings. TEX. CONST. art V, § 6; TEX. GOVT CODE, § 22.225(a); *Akin v. Dahl,* 661 S.W.2d 917, 921 (Tex. 1983); *Sweet,* 653 S.W.2d at 295.

C. ANALYSIS

Maritime concedes that the Jones Act imposes a reduced burden in proving a defendant's *liability,* but asserts the Act does not relieve a plaintiff of the burden of proving *damages* by a preponderance of the evidence. Initially, Maritime contends that by submitting the damages question based upon a preponderance of the evidence, Ellis waived any argument that a featherweight standard applies to the court of appeals' review of damages. *See De La Lastra,* 852 S.W.2d at 916. Maritime further argues that both federal and Texas appellate courts have reviewed damage awards for factual sufficiency and excessiveness using traditional standards of review in Jones Act cases. *See Nairn,* 837 F.2d at 566; *Sweet,* 653 S.W.2d at 294-95. Maritime asserts that the court of appeals used the wrong standard when it reviewed the actual damages award in this case. We disagree. As explained below, the court of appeals properly analyzed this case in the context of Maritime's point of error and argument in that court.

The record shows that during trial, Ellis offered the testimony of

five expert medical doctors, four of whom had examined and treated Ellis. Maritime did not challenge the testimony of any of the five experts at trial. All five expert witnesses testified that Ellis's severe and lengthy exposure to Diazinon caused his prolonged neural damages. They expressed their opinions on bases ranging from reasonable medical probability to without a doubt. In essence, all five experts testified that Ellis's prolonged exposure to excessive levels of Diazinon due to Maritime's negligence caused the long-term effects of delayed neurotoxicity. Maritime presented three medical doctor experts, only one of whom had treated Ellis. These three experts testified that Ellis's injuries were not a delayed effect of his Diazinon exposure.

The jury answered "yes" to the question of whether Maritime's negligence played any part, even the slightest, in producing injury or illness to Ellis. The jury then found, based on a preponderance of the evidence, that $8,576,000 in actual damages would fairly and reasonably compensate Ellis for the injuries or illnesses resulting from the occurrence in question. The trial court rendered judgment for Ellis on the jury's verdict for the actual damages together with exemplary and punitive damages and prejudgment interest.

In the court of appeals, Maritime contended the trial court erred in denying its motion for new trial because factually insufficient evidence supported the jury's finding that Ellis suffered $8,576,000 in actual damages, and because the amount was excessive. However, as the court of appeals recognized, Maritime's argument to that court was not about the amount of actual damages the jury awarded, but about causation. The court of appeals observed:

> Appellant concedes that appellee suffered short-term effects from the exposure to Diazinon and in effect, that overexposure to Diazinon is toxic to humans and can cause damage to the nervous system on some temporary basis. Thus, appellant does not contest damages for the medical treatment appellee received in New Orleans in 1982 or for the loss of two days of work. Appellant does contest damages awarded for appellee's claim of delayed and permanent neurotoxic damage on the ground that appellee's expert testimony was speculative and not based on

> reasonable medical probability. Essentially, appellant's attack is directed at the issue of *causation* as to the delayed and permanent damage found by the jury based on the *circumstantial and expert evidence before them.*

886 S.W.2d at 783 (emphasis added). Because Maritime contended there was factually insufficient evidence to support the damages award, the court of appeals considered all the evidence both in favor of and contrary to the judgment.

The court of appeals detailed the material testimony of all eight experts—five for Ellis and three for Maritime. After doing so, the court of appeals first concluded that the evidence more than satisfied the Jones Act standard for causation. 886 S.W.2d at 791. The court of appeals stated that sufficient evidence justified the jury's finding that Maritime's admitted negligence in exposing Ellis to extreme levels of a dangerous pesticide did play a part in producing the injury for which the damages were sought and awarded. 886 S.W.2d at 791. In addition to concluding that the evidence satisfied the "featherweight" burden of negligence and causation in Jones Act cases, the court of appeals also concluded that the evidence was sufficient under the higher standard of proof for causation under Texas common law. The court of appeals followed applicable law when it analyzed Maritime's challenge to causation instead of damages and when it reviewed the amount of the damages award under traditional factual sufficiency review. *See Rogers*, 352 U.S. at 506-07; *Nairn*, 837 F.2d at 566; *Landry*, 731 F.2d at 302; *Sweet*, 653 S.W.2d at 294-95. Accordingly, we conclude that the court of appeals followed the appropriate standard of review in analyzing Maritime's claims. Again, this Court has no jurisdiction to decide whether the court of appeals reached the correct result—that is whether the actual damage award was excessive. *See Akin*, 661 S.W. 2d at 921. We reject Maritime's first argument.

III. COURT OF APPEALS' REVIEW OF SCIENTIFIC EVIDENCE

Maritime's second contention is that the court of appeals erred because it did not examine whether any well-founded scientific evidence supports the actual damages award. Maritime argues that

the federal standard articulated in *Daubert* and the state standard articulated in *Robinson* and *Havner* are the proper standards for reviewing the sufficiency of Ellis's damages evidence. Significantly, Maritime does not complain about the trial court's admission of any of the scientific evidence from any of Ellis's five experts. Rather, Maritime's position is that if the court of appeals applied a proper scientific methodology test to Ellis's experts' testimony, the testimony would be legally insufficient to show that the long term conditions Ellis claims he suffers were caused by delayed neurotoxicity. Thus, Maritime concludes, by way of its complaints about the court of appeals' factual sufficiency review, that there is *no evidence* of *some* of Ellis's actual damages. Maritime's argument is flawed.

A. Daubert–Robinson–Havner

In *Daubert*, the Supreme Court considered "the standard for admitting expert scientific testimony in a federal *trial*." *Daubert*, 509 U.S. at 579 (emphasis added). *Daubert's* focus is on the trial court's discretion, when faced with an objection to scientific evidence, to admit or exclude such evidence before or during the trial. The Supreme Court added that when the trial court concludes that the disputed scientific evidence is insufficient to go to the jury, the trial court may grant a summary judgment or a directed verdict. *Daubert*, 509 U.S. at 595. However, *Daubert* does not support the proposition that a reviewing court can in effect exclude expert testimony that was not objected to based on its scientific reliability before trial or when it was offered at trial and then render judgment against the offering party.

Similarly, in *Robinson*, we granted DuPont's application for writ of error to decide "the appropriate standard *for the admission* of scientific expert testimony." *See Robinson*, 923 S.W.2d at 554 (emphasis added). Like the Supreme Court in *Daubert*, we recognized the special nature of scientific expert testimony. *See Robinson*, 923 S.W.2d at 554-58. We then explained the trial court's role as a "gatekeeper," and recognized that "[t]he trial court is responsible for making the preliminary determination of whether the proffered testimony meets the standards [for scientific reliability]." *Robinson*, 923 S.W.2d at 556. Like *Daubert*, *Robinson*'s focus is on a trial court's discretion in admitting or excluding scientific evidence after a party

lodges an objection to the reliability of its opponent's scientific expert testimony before trial or when the evidence is offered. *See Robinson*, 923 S.W.2d at 557.

Under *Havner*, a party may complain on appeal that scientific evidence is unreliable and thus, no evidence to support a judgment. *See Havner*, 953 S.W.2d 706. *Havner* recognizes that a no evidence complaint may be sustained when the record shows one of the following: (a) a complete absence of a vital fact; (b) the reviewing court is barred by rules of law or evidence from giving weight to the only evidence offered to prove a vital fact: (c) the evidence offered to prove a vital fact is no more than a mere scintilla; or (d) the evidence establishes conculsively the opposite of the vital fact. *See Havner*, 953 at S.W.2d 711 (citing Robert W. Calvert, *"No Evidence" and "Insufficient Evidence" Points of Error*, 38 TEX. L. REV. 361, 362-63 (1960)). Here, like in *Havner*, Maritime contends that because Ellis's scientific evidence "is not reliable, it is not evidence," and the court of appeals and this Court are "barred by rules of law or of evidence from giving weight" to Ellis's experts' testimony. *See Havner*, 953 S.W.2d at 711, 713.

B. ERROR PRESERVATION

To preserve a complaint that scientific evidence is unreliable and thus, no evidence, a party must object to the evidence before trial or when the evidence is offered. *See Robinson*, 923 S.W.2d at 557; *see also Havner*, 953 S.W.2d at 713 ("If the expert's scientific testimony is not reliable, it is not evidence."). Without requiring a timely objection to the reliability of the scientific evidence, the offering party is not given an opportunity to cure any defect that may exist, and will be subject to trial and appeal by ambush. *See Marbled Murrelet v. Babbitt*, 83 F.3d 1060, 1066-67 (9th Cir. 1996), *cert. denied*, 117 S. Ct. 942 (1997); *Sumitomo Bank v. Product Promotions, Inc.*, 717 F.2d 215, 218 (5th Cir. 1983).

Reviewing courts may not exclude expert scientific evidence after trial to render a judgment against the offering party because that party relied on the fact that the evidence was admitted. *Babbitt*, 83 F.3d at 1067. To hold otherwise is simply "unfair." *Babbitt*, 83 F.3d at 1067. As the *Babbitt* court explained:

> [P]ermitting [a party] to challenge on appeal the reliability of [the opposing party's] scientific evidence under *Daubert*, in the guise of an insufficiency-of-the-evidence argument, would give [appellant] an unfair advantage. [Appellant] would be 'free to gamble on a favorable judgment before the trial court, knowing that [it could] seek reversal on appeal [despite its] failure to [object at trial].'

Babbitt, 83 F.3d at 1067 (citations omitted). Thus, to prevent trial or appeal by ambush, we hold that the complaining party must object to the reliability of scientific evidence before trial or when the evidence is offered.

C. Analysis

In this case, Maritime did not object to the reliability of Ellis's scientific evidence until after the jury verdict. Maritime nevertheless argues that the court of appeals should have applied the *Daubert-Robinson-Havner*[2] rationale as part of its factual sufficiency review. These cases do not support Maritime's argument because: (1) each involve admissibility or no evidence considerations, and (2) in each case the defendants timely objected to the scientific evidence.

[2] Maritime also cites *Brock v. Merrell Dow Pharms., Inc.*, 874 F.2d 307 (5th Cir.), *modified*, 884 F.2d 166 (1989), to support its argument that Ellis's experts' testimony was not proper scientific evidence. However, like *Daubert*, *Robinson* and *Havner*, in *Brock*, Merrell Dow challenged the scientific evidence before the jury verdict. Here, Maritime did not challenge Ellis's scientific evidence until after the jury verdict.

Daubert and *Havner* involve the anti-nausea drug, Bendectin. In these two cases, plaintiffs asserted that Bendectin caused birth defects. *See Daubert*, 509 U.S. at 591; *Havner*, 953 S.W.2d at 708. *Robinson* involved a fungicide known as Benlate that DuPont manufactured. The Robinsons contended that the Benlate they used was contaminated

and damaged their pecan crop. *See Robinson*, 923 S.W.2d at 551. In all three cases, causation was hotly contested, as it is in this case, on delayed effects. In all three cases, the manufacturer objected before trial or when the evidence was offered that the plaintiffs' scientific expert testimony on causation was inadmissible because it was neither relevant nor based upon a reliable foundation. *Daubert*, 509 U.S. at 591; *Robinson*, 923 S.W.2d at 552; *Havner*, 953 S.W.2d at 708-09. Thus, the manufacturers in all three cases properly preserved their claims that the expert testimony was inadmissible and was no evidence of causation because it was not relevant and not based on well-founded scientific methodology.

In *Daubert*, Merrell Dow moved for summary judgment. The trial court granted summary judgment on the grounds that the Dauberts did not establish that the principle on which their experts based their opinions was generally accepted by the relevant scientific community. *See Daubert v. Merrell Dow Pharms., Inc.*, 727 F. Supp. 570, 572 (S.D. Cal. 1989). On appeal, the United States Supreme Court held that the criteria is whether the scientific evidence is relevant and reliable and thus admissible. The Court remanded *Daubert* to the circuit court to determine whether the expert testimony rested on a reliable foundation and was relevant. *See Daubert*, 509 U.S. at 597. On remand, the Ninth Circuit held that the testimony about Bendectin's effect was inadmissible under Federal Rule of Evidence 702.

In *Robinson*, the trial court granted DuPont's pretrial motion and excluded the Robinsons' expert testimony on the ground that it was neither relevant nor based upon a reliable foundation. *See Robinson*, 923 S.W.2d at 552. At trial, the Robinsons again attempted to introduce their expert's testimony but the trial court abided by its earlier ruling and excluded that testimony. The Robinsons then offered a bill of exception on their expert's testimony. At the close of evidence, the trial court granted DuPont's motion for directed verdict. The Robinsons appealed on the grounds that the trial court abused its discretion by excluding their expert's testimony. This Court followed *Daubert* and held that a party must show, in addition to showing an expert witness is qualified, that the expert's testimony is relevant and reliable. *See Robinson*, 923 S.W.2d at 556. Accordingly, although *Robinson* involves the exclusion of expert testimony, DuPont timely objected to the expert testimony before trial and when the evidence was offered. Unlike

Maritime, DuPont did not wait until after the verdict to challenge the reliability of its opponent's expert testimony.

In *Havner,* Merrell Dow objected to the Havners' scientific evidence "at several junctures" during the litigation. *See Havner,* 953 S.W.2d at 708. Merrell Dow moved for summary judgment contending there was no scientifically reliable evidence that Bendectin caused limb reduction birth defects or that Bendectin caused the plaintiff's birth defect. *Cf. General Elec. Co. v. Joiner,* 118 S. Ct. 512 (1997) (affirming summary judgment when plaintiff's expert evidence did not show link between polychlorinated biphenyls (PCBs) and cancer). The trial court held a hearing at which the scientific reliability of the Havner's summary judgment evidence was extensively aired. The trial court then denied Merrell Dow's motion for summary judgment. Before trial, Merrell Dow filed a motion in limine again questioning the scientific reliability of the Havner's expert testimony. The trial court denied Merrell Dow's motion in limine. During trial, Merrell Dow objected to the admission of the Havners' scientific evidence. Merrell Dow also unsuccessfully moved for directed verdict when the Havners closed their case, complaining about the Havners' scientific evidence. The trial court overruled Merrell Dow's objections and denied its motion for directed verdict. In *Havner,* while the issue was whether the scientific evidence was legally sufficient to be some evidence of causation, Merrell Dow timely challenged the experts' testimony at every opportunity in the trial court, and it properly preserved a no evidence claim. Indeed, this Court emphasized that the offering party should be allowed the opportunity to "pass[] muster" under a trial court *Robinson* objection—"to present the best evidence available"—before an appellate court considers whether legally sufficient evidence supports a judgment. *Havner,* 953 S.W.2d at 720.

Here, Maritime did not object to the scientific reliability of a single one of Ellis's five expert witnesses until after the jury verdict. Before trial, Maritime did not ask for a *Daubert/Robinson*-type hearing. *Cf. Havner,* 953 S.W.2d at 708-09. During trial, the record reflects that Maritime made nine objections while Ellis's five experts testified. Five objections complained about nonresponsiveness, three complained about leading questions, and one complained that the witness was testifying from a document not in evidence. Simply put, Maritime did not make *any* objection to the reliability of Ellis's

experts before trial or when Ellis offered the evidence. Maritime cannot complain for the first time after the verdict that the testimony from Ellis's five experts does not support the judgment. To allow otherwise would deny Ellis's scientific experts the opportunity to "pass[] muster" in the first instance and usurp the trial court's discretion as "gatekeeper." *See Havner*, 953 S.W.2d at 720; *Robinson*, 923 S.W.2d at 554.

Rules and procedures about error preservation promote certainty and fairness. Such rules also frame and develop the legal issues for appeal, giving notice to both the litigants and to appellate courts about what issues remain. Appellate courts must base their decisions on the record as made and brought forward, not on a record that should have been made or could have been made. *See Babbitt*, 83 F.3d at 1067. For this Court to decide now that Ellis's scientific evidence is unreliable under *Daubert* or *Robinson* would base appellate review on a record that was not made.

IV. RESPONSE TO THE DISSENT

We do not disagree with the dissent that "Maritime Overseas' position has always been . . . that no reliable scientific evidence shows that diazonon can cause long-term neurotoxicity." ____ S.W.2d ____. However, at trial, rather than make objections to the trial court, Maritime chose to present this argument to the jury by challenging the reliability of Ellis's scientific evidence via vigorous cross-examination, presenting contrary evidence, and through opening statement and closing argument. Thus, unlike *Havner*, the "question of scientific reliability was [not] raised repeatedly" before the trial court. *Havner*, 953 S.W.2d at 709.

Nevertheless, the dissent would hold that Maritime's decision to argue the weight of both parties' experts' testimony to the jury was sufficient to preserve a complaint about reliability for appeal. When the reliability of scientific evidence is contested, attempts at persuasion before the jury and reiterated on appeal cannot amount to preservation of error for appeal. To allow otherwise would impermissibly permit a party to strip away the trial court's role as gatekeeper in the first instance when a party wishes to contest the reliability of scientific evidence. *See Robinson*, 923 S.W.2d at 553, 556, 558 (placing a

"heightened responsibility" on trial judges "to ensure that expert testimony show some indicia of reliability" by holding them "responsible for making the preliminary determination of whether the proffered testimony meets the standards [for scientific reliability]"); *see also Daubert*, 509 U.S. at 589 (explaining that "the trial judge must ensure that any and all scientific testimony or evidence admitted is . . . reliable"). As JUSTICE GONZALEZ rightly points out in his concurring opinion, "[i]t is impossible for a [trial] court to exercise its gatekeeper function after the evidence has been admitted and the jury discharged." ____ S.W.2d ____.

Under the dissent's approach, the trial court would be converted at a party's whim from a gatekeeper to "an idle spectator rendered powerless to ensure the integrity of courtroom evidence." *Robinson*, 923 S.W.2d at 554 (quoting DuPont's argument). We decline to take away the trial court's gatekeeping function. To do otherwise would usurp the orderly and efficient disposition of appeals, deprive the proffering party of an opportunity to cure any defects in its evidence that the objecting party might pose, and in some cases, place appellate courts in the undesirable position of making decisions about evidentiary reliability absent a fully developed record.

The dissent also goes to great lengths to set forth cases that it claims stand for the proposition that "a party may complain after verdict and on appeal that evidence admitted without objection is neither legally nor factually sufficient to support the verdict." ____ S.W.2d ____. But the dissent's reliance on these cases is misplaced for those cases involve no evidence challenges where, on the face of the record, the evidence lacked probative value. *See* Calvert, *supra*, at 362-63. In contrast, by its own admission, Maritime is not making a no evidence complaint.

Maritime could have and should have objected to Ellis's evidence at trial in a timely fashion for appellate consideration. We have properly decided the case on the issues preserved at trial and raised on appeal, as our rules and precedent require.

V. CONCLUSION

We conclude that the court of appeals used the proper standard to review the factual sufficiency of Ellis's actual damages evidence.

We also conclude that because Maritime did not preserve error about Ellis's scientific expert testimony in the trial court, the court of appeals did not err in conducting its factual sufficiency review. We overrule Maritime's other points of error. Accordingly, we affirm the court of appeals' judgment.

JAMES A. BAKER
Justice

OPINION DELIVERED: April 16, 1998

CONCURRING OPINION

JUSTICE GONZALEZ, joined by JUSTICE ABBOTT with respect to Part III, concurring.

I concur with the Court's judgment. The Court correctly resolves the main issues: (1) approving the court of appeals' standard for reviewing the factual insufficiency of the evidence of a Jones Act cause of action, and (2) rejecting Maritime Overseas Company's untimely attempt to challenge the reliability of scientific evidence. *See E.I. du Pont de Nemours & Co. v. Robinson*, 923 S.W.2d 549 (Tex. 1995) (making trial courts the "gatekeepers" of scientific evidence.) I do not entirely agree with the Court's analysis of the *Robinson* issue. However, I ultimately reach the same conclusion that Maritime did not timely raise the issue. I think it is imperative to ventilate any *Robinson* issues as early as possible, preferably as a pretrial matter. To further that policy, we should give trial courts wide discretion to reject late *Robinson* objections, and hold that the trial court did not abuse its discretion in this case.

I

In *Robinson*, we made trial courts the gatekeepers of scientific evidence, charging them with the duty to screen out the speculative and unreliable. *See id.* at 556-57. It is impossible for a court to exercise its gatekeeper function after the evidence has been admitted and the

jury discharged. Until now, however, we have not discussed in depth the procedure to preserve a *Robinson* objection. Preservation was not an issue in *Robinson*, wherein we upheld the trial court's exclusion of expert testimony after a pretrial hearing on its reliability. During trial the proponent of the evidence asked the court to reconsider its pretrial ruling, and made a bill of exceptions when it did not. *See id.* at 552.

We sustained a no-evidence point without discussing error preservation in *Burroughs Wellcome Co. v. Crye*, 907 S.W.2d 497, 499 (Tex. 1995). The facts recited in the opinion do not reveal what steps Burroughs took to preserve error, other than its objections to the evidence when it was offered. We also sustained a no-evidence *Robinson* complaint in *Merrell Dow Pharm., Inc. v Havner*, 953 S.W.2d 706 (Tex. 1997). Preservation of error was beyond question in that case because Merrell Dow repeatedly challenged certain scientific evidence, raising the issue in a motion for summary judgment, motions in limine, extensive pretrial hearings on the motions, objection during the expert's testimony, a motion for a directed verdict at the close of the Havners' evidence, and multiple post-trial motions. *Id.* at 708-09; *Merrell Dow Pharm., Inc. v. Havner*, 907 S.W.2d 535, 539 (Tex. App.—Corpus Christi 1994).

The Court resolves the question in this case by characterizing Maritime's *Robinson* argument as a no-evidence complaint, and then holding that Maritime failed to preserve a legal insufficiency point. The dissenting opinion also treats Maritime's arguments as legal insufficiency points. I think their respective analyses are wrong for two reasons. First, Maritime's arguments here are not true no-evidence points. As the Court observes, Maritime expressly disavows any legal insufficiency complaint, and instead claims only to challenge the court of appeals' standard of review when it evaluated factual insufficiency. Maritime's prayer for relief seeks only a new trial. I would take Maritime's arguments at face value and not try to read a no-evidence point into them.

Maritime argues instead that the evidence of causation is factually insufficient because the record is utterly devoid of reliable scientific evidence of causation. Such an argument would be a legitimate factual insufficiency argument if made to a court of appeals. A court of appeals reviewing factual insufficiency considers all of the evidence to see if

"the evidence supporting the finding is so weak or the evidence to the contrary is so overwhelming that the finding should be set aside and a new trial ordered." *Garza v. Alviar*, 395 S.W.2d 821, 821 (Tex. 1965). If there is no evidence to support the verdict, then certainly the court of appeals could conclude that the evidence is too weak to support the verdict. If the appellant's only viable point is factual insufficiency, the court of appeals should remand for a new trial. *See Wright Way Spraying Serv. v. Butler*, 690 S.W.2d 897, 898 (Tex. 1985).

However, an argument proper in the court of appeals may not be appropriate in our Court because of our limited jurisdiction over factual insufficiency. Our jurisdiction over factual insufficiency is limited to whether the court of appeals applied the proper standard of review. *See In re King's Estate*, 244 S.W.2d 660, 661-62 (Tex. 1951). Maritime asserts that is only wants us to exercise our limited jurisdiction over standards of review, but its arguments come perilously close to asking us to substitute our opinion for that of the court of appeals. I question whether our jurisdiction would allow us to consider the merits of Maritime's argument. *See Havner v. E-Z Mart Stores, Inc.*, 846 S.W.2d 286, 286 (Tex. 1992) (Gonzalez, J., concurring on denial of application for writ of error) (cautioning that this Court must not second-guess the court of appeals' review of factual insufficiency); *Lofton v. Texas Brine Corp.*, 777 S.W.2d 384, 388 (Tex. 1989) (Hecht, J., dissenting) (criticizing the Court for circumventing constitutional limitations over factual insufficiency through pretextual legal issues). *Compare with Jaffe Aircraft Corp. v. Carr*, 867 S.W.2d 27, 29-30 (Tex. 1993) (Gonzalez, J., concurring) (noting rare circumstance that allowed this Court to exercise jurisdiction over a court of appeals' factual insufficiency review). In any event, since Maritime only brings a factual insufficiency point, it is not necessary to decide if Maritime preserved a no-evidence complaint.

II

Moreover, whether we categorize Maritime's arguments as factual insufficiency or legal insufficiency does not resolve the case for me. I do not think the usual rules for preserving either factual or legal insufficiency complaints adequately address the concerns unique to *Robinson* issues.

Ordinarily. both legal and factual insufficiency points may be preserved by post-judgment motions. *See Cecil v. Smith*, 804 S.W.2d 509 (Tex. 1991). A court simply looks at the record to determine the existence and weight of evidence to prove a given point. Appellate courts and trial courts make such a review without additional information from outside the record. However, the no-evidence analysis we describe in *Havner* is qualitatively different from the ordinary evidentiary review:

> [W]e emphasize that courts must make a determination of reliability from all the evidence. Courts should allow a party, plaintiff or defendant, to present the best available evidence, assuming it passes muster under *Robinson*, and only then should a court determine from a totality of the evidence, considering all factors affecting the reliability of particular studies, whether there is legally sufficient evidence to support a judgment.

Merrell Dow Pharm., Inc. v. Havner, 953 S.W.2d at 720.

It should be apparent that appellate courts constitutionally cannot conduct such a hearing in the first instance. However, I do not think that allowing parties to raise *Robinson* objections for the first time post verdict, or even during trial, is fair to the litigants or judicially efficient.

A court should not be required to interrupt trial to conduct a *Robinson* hearing which could have been held pretrial. *As Merrell Dow v. Havner* illustrates, the trial court's role gatekeeper requires it to decide complex issues in fields outside its primary expertise. Some courts have tried innovative approaches, such as selecting neutral experts in the field to serve as masters, a step I encourage when the issues are especially complex. *See Justice Breyer Calls for Experts to Aid Courts in Complex Cases*, N.Y. Times, Feb., 17, 1998, at A17. Such innovation is not possible if the trial court is not given advance warning.

I recognize that there may be instances of good cause for not making a *Robinson* objection pretrial, in which case the trial court should entertain the objection. Also, some opinion testimony may be so untenable on its face that no *Robinson* hearing is necessary.

For example, our Court recognized long before *Robinson* that courts are not bound by testimony at odds with indisputable physical facts and common knowledge because it has no probative value. *Humble Oil & Refining Co. v. Martin*, 222 S.W.2d 995, 1001-02 (Tex. 1949) (holding that court could disregard petitioner's "incredible" testimony that she had secured her automobile by engaging the reverse gear before it rolled downhill striking pedestrians). Such situations will be comparatively rare, however. Our discovery rules require the proponent of expert testimony to identify the witnesses and the substance of their opinions in response to appropriate discovery. Thus in the ordinary case, it should be very apparent at the discovery stage that a party will proffer scientific testimony. The opponent of such testimony should bring its objections to the trial court's attention so that the trial court may resolve them without interfering with the eventual trial.

III

As a final note, I encourage trial courts to aggressively exercise their role as gatekeepers of scientific evidence. There are many steps a court could take to try cases efficiently and fairly, with fidelity to sound scientific methodology. For example, a court could:

1) require parties to notify opponents and the court sufficiently in advance of the trial of plans to either offer scientific evidence or challenge an opponent's evidence;
2) conduct a preliminary hearing on admissibility in advance of plans to offer the evidence;
3) in complex litigation, appoint a panel of specially trained scientists or a special master to hear evidence and report on complicated scientific and statistical matters. The report would be filed with the clerk's office. If the parties request it, the court should conduct a hearing on the report and allow the parties to cross examine the court experts (the expert's fees would be taxed as court costs);
4) render expert testimony inadmissible or rule objections waived unless the parties fully comply with the notice requirements set out above.

In sum, because a *Robinson* objection profoundly impacts the trial of a case, an opponent to proffered scientific evidence should raise the issue of reliability early in the litigation or risk losing the objection. I agree with the Court that an opponent to scientific evidence must object to it when offered, at the very latest. However, I would go further and hold that if a party knows pretrial about the existence of *Robinson* issues but fails to ask for a pretrial hearing, any objection about the admission or exclusion of such evidence raised for the first time during trial is waived.

RAUL A. GONZALEZ
Justice

OPINION DELIVERED: April 16, 1998

DISSENTING OPINION

JUSTICE HECHT, joined by CHIEF JUSTICE PHILLIPS dissenting.

Maritime Overseas Corporation seeks a new trial because, while Richard Ellis was undeniably injured by his exposure to diazinon, the scientific evidence does not support the conclusion that he suffers from permanent neurotoxicity, and thus the $8,576,000 awarded him in damages is excessive. The Court holds that it could not order a new trial even if it agreed with Maritime Overseas' contention, completely ignoring its decision to grant a new trial in indistinguishable circumstances just one year ago in *Texarkana Memorial Hospital, Inc. v. Murdock*, 946 S.W.2d 836 (Tex. 1997). The Court also holds that Maritime Overseas failed to preserve its complaint for appeal because it did not object to Ellis's evidence at trial, even though Maritime Overseas' position has always been—in its opening statement, its extensive examination of the expert witnesses, its closing argument, its motion for new trial, and on appeal—that no reliable scientific evidence shows that diazinon can cause long-term neurotoxicity. As Ellis's attorney told the jury in his opening statement, Maritime Overseas' "position is that this chemical just cannot cause an injury to a worker's nervous system." Maritime Overseas' position has

never been in doubt.

Not one case the Court cites so much as hints that a party in Maritime Overseas' circumstances has failed to preserve error, and one of those cases, *Sumitomo Bank v. Product Promotions, Inc.* 717 F.2d 215, 218 (5th Cir. 1983), actually suggests that Maritime Overseas has preserved its position. The Court refuses to acknowledge, much less reconcile, its own numerous precedents that require reversal of a judgment based on non-probative evidence, even though the evidence was admitted without objection. The Court appears to think that if it ignores these cases they will somehow go away. The Court steadfastly evades the one and only issue over which these parties have fought since the day this litigation began—whether there is reliable evidence that Ellis suffers from neurotoxicity. I would decide this issue; therefore I dissent.

I

It is undisputed that Ellis suffered some injury from his exposure to diazinon and should recover some damages, but it is equally undisputed that if he did not suffer long-term neurotoxicity, his damages are nowhere near $8,576,000. The court of appeals, in determining the factual sufficiency of the evidence, considered expert testimony that Ellis not only was injured but that he suffers from neurotoxicity. Maritime Overseas argues that evidence offered in support of Ellis's long-term injury claims is unreliable and therefore no evidence at all. Thus, Maritime Overseas contends that the court of appeals erred in considering such testimony in its factual sufficiency review. The Court correctly summarizes Maritime Overseas' argument: "In essence, Maritime would have this Court conduct a no evidence review of the evidence about delayed neurotoxicity within the Court's review of whether the court of appeals properly reviewed the factual sufficiency of the evidence." *Ante* at ____ [App. A-4]. Then the Court says: "We decline to do so." *Id.*

But the Court did not "decline to do so" last year in *Texarkana Memorial Hospital, Inc. v. Murdock*, 946 S.W.2d 836 (Tex. 1997). Murdock sued the Texarkana Memorial Hospital for negligence in delivering her daughter. The child was born with severe congenital defects and died about a year later. Murdock claimed that she was

entitled to damages equal to all of the child's medical expenses, but the Hospital argued that Murdock could recover only for those expenses caused by its negligence, excluding expenses for treatment necessitated by the child's congenital defects. The district court awarded Murdock the total expenses, and the court of appeals affirmed, holding that legally and factually sufficient evidence supported the conclusion that all the medical expenses were caused by the Hospital's negligence. *Texarkana Memorial Hosp, Inc. v. Murdock*, 903 S.W.2d 868, 877-880 (Tex. App.–Texarkana 1995), *rev'd*, 946 S.W.2d 836 (Tex. 1997). In this Court, the Hospital argued that there was "no evidence of a direct causal link between the amount of medical expenses awarded and any injuries caused by [the Hospital's] negligence." *Murdock*, 946 S.W.2d at 837. We agreed and reversed the award, explaining:

> [W]hile [there] is some evidence of damage caused by [the Hospital's] negligence, a plaintiff may recover only for those injuries caused by the event made the basis of suit. *Morgan v. Compugraphic Corp.*, 675 S.W.2d 729, 732 (Tex. 1984). The case before us is analogous to other cases where a suit for medical expenses involved another injury or pre-existing condition. . . . We . . . hold that a plaintiff should recover only for medical expenses specifically shown to result from treatment made necessary by the negligent acts or omissions of the defendant, where such a differentiation is possible.

Id. at 839-840 (citation omitted). Although the Hospital couched its complaint in no-evidence terms, for which the remedy is ordinarily rendition of judgment, we concluded that "[b]ecause Murdock . . . presented legally sufficient evidence that some of the medical expenses resulted from [the Hospital's negligence], [she] should be afforded an opportunity to develop this evidence further." *Id* at 841. Thus, we remanded the case for a new trial. In support of this conclusion we cited *Stewart Title Guaranty Co. v. Sterling*, 822 S.W.2d 1, 10-12 (Tex. 1991), in which we remanded a case for a new trial on attorney fees because the evidence supported an award of some fees for some claims, even though fees could not be awarded on all claims.

The present case is indistinguishable from *Murdock*. There, as here, the argument was that while some evidence showed some

damages, no evidence supported all the damages awarded. Although the Hospital complained of the legal sufficiency of the evidence, it in effect challenged the court of appeals' factual sufficiency review for considering non-probative evidence, and we treated the complaint as being directed to that review, remanding for a new trial rather than rendering judgment for the Hospital. Maritime Overseas' application for writ of error states: "There is no evidence that diazinon causes delayed neurotoxicity and thus insufficient evidence that Ellis suffered $8,576,000 in actual damages." The arguments in the two cases, while phrased differently, are indistinguishable in import and effect. The arguments and the relief sought are the same in both.

Why isn't *Murdock* controlling or at least instructive? The Court refuses to answer, refuses even to cite *Murdock*. The argument that there is some significance in the Hospital's no-evidence challenge and Maritime Overseas' insufficient-evidence challenge is too weak even for the Court to employ. If anything, Maritime Overseas' contention that the evidence of damages is insufficient because there is no evidence of some damages awarded is more straightforward than the Hospital's contention that there was no evidence of the damages awarded because there was some evidence of only lesser damages. But in fact, both arguments come out at the same place, in substance—some but not all of the damages are supported by the evidence—and in result—a new trial excluding the unsupported claims. Maritime Overseas' first point of error in his Court asserts: "The court of appeals erred in failing to examine whether any well-founded scientific methodology supports the award of . . . actual damages." Even if Maritime Overseas could be faulted for misphrasing its point of error, that mistake cannot dictate the result in the case.

> A point of error "is sufficient if it directs the attention of the appellate court to the error about which complaint is made." Courts are to construe rules on briefing liberally. An appellate court should consider the parties' arguments supporting each point of error and not merely the wording of the points.

Anderson v. Gilbert, 897 S.W.2d 783, 784 (Tex. 1995) (per curiam) (citations omitted). Maritime Overseas' argument in its application for writ of error is crystal clear:

> In this case, Ellis offered *no* epidemiological study, *no* peer-reviewed theory, *nor any* evidence of general scientific acceptance to support the conclusion of his experts that his exposure to diazinon caused delayed neurotoxicity. The premise upon which his experts' conclusion was based—that because some organophosphates can cause delayed neurotoxicity, diazinon therefore must cause delayed neurotoxicity—is false logic, as pointed out by Justice Robertson's concurring and dissenting opinion, because *some* organophosphates *do not* cause delayed neurotoxicity.

To make the matter even clearer, Maritime Overseas summarizes its position thusly: "There is no evidence that diazinon causes delayed neurotoxicity and thus insufficient evidence that Ellis suffered $8,576,000 in actual damages."

The result in *Murdock* was correct, and the same analysis should be applied in this case. A party must have a means of contesting the amount of damages when there is evidence for some claims but not all of them. Following *Murdock*, Maritime Overseas is entitled to a new trial if its evidentiary complaint has been preserved and has merit. The Court holds that Maritime Overseas' complaint was not preserved and does not reach the merits.

II

As early as 1912, and as recently as last year, this Court has held that a party may complain after verdict and on appeal that evidence admitted without objection is neither legally nor factually sufficient to support the verdict. The Court ignores a solid line of cases establishing this principle with respect to all kinds of evidence, including scientific testimony. There is no authority for the Court's holding that "[t]o preserve a complaint that scientific evidence is unreliable and thus, no evidence, a party must object to the evidence before trial or when the evidence is offered." *Ante* at ____ [App. A-11]. The notion that a party must as a matter of course object to evidence *before* trial is a complete stranger to our procedure. Despite this lack of authority, it seems clear that parties should be required to contest the reliability of scientific testimony in some way prior to the verdict

in most instances. However, Maritime Overseas did so in this case.

A

As a rule, a contention that evidence is insufficient to support a judgment need not be raised before the verdict. Rule 279, TEX. R. CIV. P., states: "A claim that the evidence was legally or factually insufficient to warrant the submission of any question may be made for the first time after verdict, regardless of whether the submission of such question was requested by the complainant." Prior to the verdict, a party may, but is not required to, raise the complete absence of evidence on a point. This differs from federal procedure, which requires that a motion for judgment as a matter of law be made before the case is submitted to the jury "to assure the responding party an opportunity to cure any deficiency in that party's proof that may have been overlooked until called to the party's attention". FED. R. CIV. P. 50(a)(2) advisory committee's note. Texas procedure does not afford parties the same protection. Thus, for example, a defendant sued for reasonable and necessary expenses can wait until after the verdict to point out that the plaintiff never offered evidence that the expenses claimed were reasonable. *See McCreless Properties, Ltd. v. F. W. Woolworth Co.*, 533 S.W.2d 863, 868 (Tex. Civ. App.—San Antonio 1976, writ ref'd n.r.e.); *Holt v. Purviance*, 347 S.W.2d 321, 324-325 (Tex. Civ. App.—Dallas 1961, writ ref'd n.r.e.). A defendant sued for attorney fees may wait until after the verdict to assert that no evidence of the required presentment of the claim was offered. *See Jim Howe Homes, Inc. v. Rogers*, 818 S.W.2d 901,905 (Tex. App.—Austin 1991, no writ). A pre-verdict objection to the factual insufficiency of the evidence cannot preclude submission to the jury of pleaded claims, *Brown v. Goldstein*, 685 S.W.2d 640, 641 (Tex. 1985), and thus has essentially no effect.

Even if evidence is admitted without objection, it may be insufficient to support a judgment. This Court held eighty-six years ago that "incompetent testimony can never form the basis of a finding of facts in an appellate court, notwithstanding its presence in the record without objection." *Henry v. Phillips*, 151 S.W. 533, 538 (Tex. 1912). In that case, testimony admitted without objection was held to be no evidence on appeal because it was hearsay. *Id.* at 537. The Court

repeatedly treated hearsay as no evidence even if it was not objected to, until Rule 802 of the Texas Rules of Civil Evidence was adopted in 1983. *Zobel v. Slim*, 576 S.W.2d 362, 369 (Tex. 1978); *Cooper Petroleum Co. v. LaGloria Oil & Gas Co.*, 436 S.W.2d 889, 891 (Tex. 1969); *Aetna Ins. Co. v. Klein*, 325 S.W.2d 376, 379 (Tex. 1959); *City of Mission v. Popplewell*, 294 SW.2d 712, 717 (Tex. 1956); *Texas Co. v. Lee*, 157 S.W.2d 628, 631 (Tex. 1941). But the principle in *Henry* has been applied to evidence other than hearsay.

In *Casualty Underwriters v. Rhone*, 132 S.W.2d 97 (Tex. 1939), Rhone sought compensation for injuries sustained while working on a construction site. The dispute centered on whether at the time of his injuries he was employed by the general contractor, Beaumont Development Corporation, or a subcontractor, McDaniel. The jury found that Rhone was employed by the general contractor, but the court of civil appeals reversed, holding as a matter of law that Rhone was employed by the subcontractor. We affirmed the court of civil appeals, holding that testimony by Rhone and McDaniel contrary to its conclusion, though not objected to, was no evidence.

> The only testimony in the record which would in the least tend to support the conclusion that Rhone was working for the Beaumont Development Corporation was given by Rhone and McDaniel, each of whom testified that, at the time of the injury, Rhone was working for it. Those statements did not amount to any evidence at all. They were but bare conclusions and therefore incompetent, and the fact that they were admitted without objection adds nothing to their probative force.

Id. at 99.

The Court followed *Rhone* in *Dallas Railway & Terminal Company v. Gossett*, 294 S.W.2d 377 (Tex. 1956). In that case, a bus passenger, Gossett, recovered damages for injuries she sustained when the bus struck a car. The bus company, Dallas Railway, impleaded the driver of the car, Sample, contending that her negligence in driving the wrong way on a one-way street caused the accident. The jury failed to find Sample negligent. On appeal, Dallas Railway argued that the evidence established Sample's negligence because it was undisputed

that she was driving the wrong way on a one-way street. The bus driver, Gossett, Sample, and an accident investigator all testified that they believed traffic on the street was one-way, but no evidence was offered showing that traffic was legally restricted. The Court held that the witnesses' testimony did not establish that the street was one-way, explaining: "It is well settled that the naked and unsupported opinion or conclusion of a witness does not constitute evidence of probative force and will not support a jury finding even when admitted without objection." *Id.* 380-381.

Two cases cited by *Gossett* with approval apply the same principle in other settings. In one, *Webb v. Reynolds*, 207 S.W. 914 (Tex. Comm'n App. 1919, judgm't adopted), the court held that a plaintiff's testimony that he owned a promissory note was no evidence to support his claim because the statement "was a bare conclusion or opinion of the witness without any basis of fact". *Id.* at 916. Plaintiff's own pleadings asserted that the note was owned by an estate. *Id.* The court added: "The fact that [the testimony] was not objected to could add nothing to its probative force." *Id.* In the other, *Perren v. Baker Hotel*, 228 S.W.2d 311 (Tex. Civ. App.—Waco 1950, no writ), the court held that a wife's testimony that her husband had agreed to rent hotel rooms "was nothing more than a bare conclusion on the part of the witness concerning a question of law and such testimony had no probative force, even though it had been admitted without any objection." *Id.* at 317.

In *Robertson Tank Lines, Inc. v. Van Cleave*, 468 S.W.2d 354 (Tex. 1971), this Court held that a plaintiff's testimony that he was acting in the course and scope of his employment at the time he was injured was no evidence to support a finding to that effect. Even though the testimony was admitted without objection, it was attacked in cross-examination. The Court stated:

> This court has approved the holding that testimony of an employee (driver) that he was acting within the course of his employment at the time of an accident is not admissible. If such testimony is admitted, with or without objection, it has been held to be incompetent and without probative force. It will not support a verdict or a finding of fact by a court.

Id. at 360 (citations omitted).

In *Schafer v. Texas Employers' Insurance Association*, 612 S.W.2d 199 (Tex. 1980), Schaefer claimed compensation benefits, alleging that he suffered from an occupational disease, atypical tuberculosis. The carrier disputed that Schaefer contracted his disease at work. His treating physician, Dr. Anderson, testified "that in his opinion, based on reasonable medical probability, Schafer's disease resulted from his employment." *Id.* at 202. The defendant attacked Dr. Anderson's opinion on cross-examination but did not object to its admission. The jury found for Schaefer, but the court of civil appeals reversed and rendered judgment for the carrier. This Court affirmed, refusing to take Dr. Anderson's opinion at face value and looking instead to the basis for it. The Court explained:

> The basis for [Dr. Anderson's] opinion is that persons engaged in "dirty" occupations, such as farmers, tend to have a greater exposure to the bacteria; that Schaefer frequently worked in soil contaminated by bird droppings; that Schaefer suffers from one of the serotypes of m. intracellularis; and, therefore, he has an occupational disease. Notwithstanding Dr. Anderson's opinion, there is a crucial deficiency in the proof of causation. The evidence fails to establish that any bacteria was present in the soil where Schaefer worked.

Id. at 203. After quoting extensively from Dr. Anderson's testimony, the Court continued that his opinion was no evidence of the cause of Schaefer's disease because it lacked any real basis:

> Dr. Anderson assumes that Schaefer is infected with an avian serotype m. intracellularis pathogenic to fowl. He further assumes that this serotype was present in bird droppings where Schaefer worked. It is admitted that the particular strain of m. intracellularis from which Bobby Schaefer suffers has not been identified. Is is also admitted that the manner in which the disease was transmitted to Schaefer is unknown. It is further admitted that there is no evidence that the bacteria is present in the soil where Schaefer worked, or even in Nueces County.

> We have reviewed the substance of Dr. Anderson's testimony in its entirety and we find that it does no more than suggest a possibility as to how or when Schaefer was exposed to or contracted the disease. We hold that his opinion is not based upon reasonable medical probability but relies on mere possibility, speculation, and surmise. We hold there is no evidence that the disease suffered by Bobby Schaefer is an occupational disease "arising out of and in the course of employment." The fact that proof of causation is difficult does not provide a plaintiff with an excuse to avoid introducing some evidence of causation. To ignore the substance of Dr. Anderson's testimony and accept his opinion as "some" evidence simply because he used the magic words "reasonable probability", effectively removes this Court's jurisdiction over any case requiring expert opinion testimony. Under such view, so long as an expert states the words "reasonable probability," in giving his opinion, there would be some evidence. The question would then be solely one of sufficiency of the evidence over which this Court has no jurisdiction.

Id. at 204-205 (citations omitted).

We reaffirmed *Schaefer* in *Burroughs Wellcome Company v. Crye*, 907 S.W.2d 497 (Tex. 1995). In that case plaintiff Crye's treating physician, Dr. Blesius, testified without objection that Polysporin sprayed on Crye's foot caused frostbite. The jury found for Crye, and the court of appeals affirmed, concluding that the evidence was factually and legally suffucient to support the verdict. *Burroughs Wellcome Co. v. Crye*, 912 S.W.2d 251, 259 (Tex. App.—El Paso 1994), *rev'd*, 907 S.W.2d 497 (Tex. 1995). We reversed, despite the admission of Dr. Blesius' testimony without objection, because his opinion had no factual basis. We stated:

> We hold that Dr. Blesius' testimony constitutes no evidence that Polysporin spray caused Crye to sustain a frostbite injury. When an expert's opinion is based on assumed facts that vary materially from the actual, undisputed facts, the opinion is without probative value and cannot support a verdict or judgment. *See Schaefer*

> *v. Texas Employers' Ins. Ass'n.*, 612 S.W.2d 199, 202-05 (Tex. 1980) (reviewing substance of medical expert's testimony and holding that this testimony constitutes no evidence of causation, as it is based on assumptions, possibility, speculation, and surmise).

Id. at 499-500 (citation omitted).

Just last year in *Merrell Dow Pharmaceuticals, Inc. v. Havner*, 953 S.W.2d 706 (Tex. 1997), we reiterated that "an expert's bare opinion will not suffice" to provide evidence of causation of an injury; "[t]he substance of the testimony must be considered." *Id.* at 711. Merrell Dow asserted in the trial court that scientific evidence of any causal connection between the use of Bendectin and birth defects was unreliable, and it "objected to the admission of some, but not all, of this evidence." *Id.* at 709. We held that the expert testimony, even that admitted without objection, was no evidence to support a judgment for Havner because the testimony showed that there was no basis for the experts' opinions. We said: "When the expert 'br[ings] to court little more than his credentials and a subjective opinion,' this is not evidence that would support a judgment." *Id.* at 712 (citation omitted). We added:

> Justice Gonzalez, in writing for the Court, gave rather colorful examples of unreliable scientific evidence in *E.I. du Pont de Nemours & Co. v. Robinson*, 923 S.W.2d 549, 558 (Tex. 1995), when he said that even an expert with a degree should not be able to testify that the world is flat, that the moon is made of green cheese, or that the Earth is the center of the solar system. If for some reason such testimony were admitted in a trial without objection, would a reviewing court be obliged to accept it as some evidence? The answer is no. In concluding that this testimony is scientifically unreliable and therefore no evidence, however, a court necessarily looks beyond what the expert said. Reliability is determined by looking at numerous factors including those set forth in *Robinson* and [*Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993)]. The testimony of an expert is generally *opinion* testimony. Whether it rises to the

> level of *evidence* is determined under our rules of evidence, including Rule 702, which requires courts to determine if the opinion testimony will assist the jury in deciding a fact issue. While Rule 702 deals with the admissibility of evidence, it offers substantive guidelines in determining if the expert testimony is some evidence of probative value.

Id. (emphasis in original).

Within the past few months we denied the application for writ of error in *Williams v. Gaines*, 943 S.W.2d 185 (Tex. App.—Amarillo 1997, writ denied). In that case, Gaines sued Williams for removing her as president of a corporation in which he was sole shareholder and terminating her employment with the corporation. The jury found that Williams breached his agreement with Gaines and that her damages included $92,500 as the value of the stock as of a specific date that Williams promised Gaines but did not convey. The court of appeals reversed the judgment for Gaines and remanded the case for a new trial, holding that there was no evidence to support the jury's damages finding. Gaines and an expert witness had testified without objection to the value of the stock based solely on data after the date at issue. The court concluded: "Because the data relied upon by Ms. Gaines to support the jury's award is based on subsequent data, there was no probative evidence of the fair market value of one-half of the [corporation's] stock on [the specified date]". *Id.* at 193. The court explained: "Opinion evidence based on conjecture or speculation lacks probative value. Incompetent evidence, even if not objected to at trial, may not be considered as probative in determining the legal and factual sufficiency of the evidence." *Id.* (citation omitted).

To summarize, bare conclusions and assertions unsupported by facts of record, expert opinions based on facts merely assumed and not proved, or facts different from those proved, and scientific testimony without any reliable basis, even if admitted without objection, are no evidence to support a finding of fact. An expert's opinion that disease was contracted through working conditions, or that a spray caused frostbite, or that a medication caused birth defects, even if admitted without objection, is not probative evidence if the testimony shows that the opinion lacks any substantial basis. This

is not to say that the deficiency in the evidence need not be pointed out in any way before the verdict, but only that it can be done by cross-examination and means other than objections.

B

The Court holds: "To preserve a complaint that scientific evidence is unreliable and thus, no evidence, a party must object to the evidence before trial or when the evidence is offered." *Ante* at ____ [App. A-11]. Whatever the Court means by objecting to evidence before trial, the four cases the Court cites as authority do not support this holding. The first case, *Robinson*, does not consider the issue. In that case, the subject evidence was objected to and excluded by the trial court. Whether any objection was necessary was never addressed by this Court. In the second case, *Havner*, we stated quite plainly that objection was made to the admission of "some, but not all" of the evidence at issue. "[T]he question of scientific reliability was raised repeatedly", but not consistently by objection. *Havner*, 953 S.W.2d at 709.

The other two cases, *Marbled Murrelet v. Babbitt*, 83 F.3d 1060 (9th Cir. 1996), *cert. denied*, 117 S. Ct. 942 (1997), and *Sumitomo Bank v. Product Promotions, Inc.* 717 F.2d 215 (5th Cir. 1983), the Court cites for the proposition that "[w]ithout requiring a timely objection to the reliability of the scientific evidence, the offering party is not given an opportunity to cure any defect that may exist, and will be subject to trial and appeal by ambush." *Ante* at ____ [App. A-11]. There are two flaws in the Court's reliance on these cases. First, as noted earlier, Texas procedure allows the sufficiency of the evidence to be challenged for the first time after verdict, whereas federal procedure does not. Thus Texas procedure allows for some ambush that federal procedure precludes. Second, *Sumitomo Bank* holds only that in determing whether there is no evidence to support a finding such that judgment should be rendered notwithstanding the verdict, evidence ruled admissible cannot be excluded from consideration. *See also Schudel v. General Elec. Co.*, 120 F.3d 991, 995 (9th Cir. 1997) ("when deciding a motion for JNOV, a trial court may not ignore evidence erroneously admitted at trial, [because] excluding evidence after the verdict is unfair to a party who may

have relied on the determination that the evidence was admissible."). While this reasoning applies in deciding whether to render judgment notwithstanding the verdict, it does not apply in deciding whether to grant a new trial. As the court explained in *Sumitomo Bank:*

> The trial judge erred in retroactively striking the summary exhibits and then gauging the jury's performance on the fictive basis that the summary evidence was not before it. *Although acceptable in the context of a motion for new trial, see Montgomery Ward & Co. v. Duncan*, 311 U.S. 243, 61 S.Ct. 189, 85 L.Ed 147 (1940), this methodology is not appropriate in connection with a motion for judgment n.o.v.

717 F.2d at 218 (emphasis added). As the court noted, the Supreme Court explained the difference between motions for judgment n.o.v. and motions for new trial in *Montgomery Ward:*

> Each motion, as the rule recognizes, has its own office. The motion for judgment cannot be granted unless, as matter of law, the opponent of the movant failed to make a case and, therefore, a verdict in movant's favor should have been directed. The motion for a new trial may invoke the discretion of the court in so far as it is bottomed on the claim that the verdict is against the weight of the evidence, that the damages are excessive, or that, for other reasons, the trial was not fair to the party moving; *and may raise questions of law arising out of alleged substantial errors in admission or rejection of evidence* or instructions to the jury.

311 U.S. at 251 (emphasis added).

Maritime Overseas contends here that it is entitled to a new trial, not that judgment should be rendered in its favor. Thus, the Court's reasoning, and the cases it cites, are inapposite. Our rules of procedure do not require a party to assert before the verdict that the evidence is insufficient to support a verdict. The factual sufficiency of the evidence may always be attacked post-verdict, even if no objection was made to its admissibility. Indeed, as the Supreme Court observed, one consideration in deciding whether to grant a new trial is whether

there were substantial errors in the admission or rejection of evidence. As already demonstrated, our own precedents permit evidence to be rejected post-verdict as non-probative in at least some instances, even if it was admitted without objection.

C

The Court holds that the reliability of scientific evidence must be objected to before trial or when the evidence is offered. How one objects to evidence before trial is not entirely clear. The Court mentions Merrell Dow's motion for summary judgment and motion in limine in *Havner*, suggesting that these are ways in which scientific evidence can be challenged. As already noted, the Court states that "Merrell Dow objected to the admission of the Havners' scientific evidence", *ante* at ____ [App. A-14], but this is only partly true. Merrell Dow only objected to some of the Havners' evidence. Had Merrell Dow been foreclosed from attacking the reliability of evidence to which it did not object, there would have been evidence to support the verdict. Thus, the Court's holding that no evidence supported the verdict was despite the absence of objections.

The Court states that *Havner* "emphasized that the offering party should be allowed the opportunity to 'pass[] muster' under a trial court *Robinson* challenge–'to present the best evidence available'–before an appellate court considers whether legally sufficient evidence supports a judgment." *Ante* at ____ [App. A-14]. What *Havner* actually said was:

> In sum, we emphasize that courts must make a determination of reliability from all the evidence. Courts should allow a party, plaintiff or defendant, to present the best available evidence, assuming it passes muster under *Robinson*, and only then should a court determine from a totality of the evidence, considering all factors affecting the reliability of particular studies, whether there is legally sufficient evidence to support a judgment.

953 S.W.2d at 720. The point was, as we said, that the reliability of scientific evidence must be determined from a review of all the evidence, not simply the evidence of one party or the other. Only by

alchemy can this passage be turned into a requirement that evidence be objected to before its reliability can be determined.

The Court does not explain the holding in *Schaefer* and other cases cited above, where evidence was held to be non-probative even though it had been admitted without objection. Instead, the Court refers vaguely to a pretrial "*Daubert/Robinson*-type hearing." *Ante* at ____ [App. A-14]. The Court does not explain what kind of hearing this is, how it is invoked, when it is to be conducted relative to the commencement of trial, and whether it is required.

Our precedents seem to teach that parties should not be permitted to attack evidence for the first time after the verdict unless it is plainly without probative value—such as an opinion based on the moon's being made of green cheese, or a mere assertion that a person is another's employee, or that a person was injured in the course of work, or that a person made an agreement. In most situations, however, if the probative value of evidence is to be in question, then ordinarily the issue must be raised before the verdict. This prevents the ambush that concerns the Court and puts both parties and the trial court on notice of the contentions in the case. But it hardly makes sense to require a specific objection to each line of scientific opinion testimony when a party's stated, clear position is that the opinion is baseless. In *Schaefer*, for example, the carrier's position was plain from its cross-examination of the claimant's physician: his opinion that the claimant contracted atypical tuberculosis at work had no basis in fact. Likewise, in *Havner*, there could be no mistake that Merrell Dow's position throughout, as in all the other Bendectin cases previously tried, was that there was no reliable evidence that Bendectin caused birth defects.

In the case before us, there was never any doubt about Maritime Overseas' position. In his opening statement, Ellis's attorney told the jury:

> The attorney representing the company told you yesterday that—well, their position is that this chemical just cannot cause an injury to a worker's nervous system. That's just not true. In fact, you'll hear evidence from the witnesses that it can cause an injury if it is—if the exposure is sufficiently great and if the exposure is on the order of what this man was exposed to.

Maritime Overseas' counsel responded in his opening statement:

> [W]e think the medical evidence will show that the effects of diazinon are not long-term but, indeed, are confined within a specific period of time. Certainly no more than months.
>
> And the evidence will show, and we'll bring in a toxicologist and a neuropsychologist who will testify that there is no relationship between the current situation exhibited by Mr. Ellis in the exposure to diazinon on the ship in 1982.

The dispute over this issue pervaded the examination and cross-examination of the eight expert witnesses. The focus of all the testimony was not on Ellis's initial poisoning from his exposure to diazinon, but whether he suffered any long-term injury. The possibility that diazinon causes neurotoxicity was thoroughly explored, and Maritime Overseas established that no studies or other evidence exist to support the opinions of Ellis's experts that he suffered from neurotoxicity caused by exposure to diazinon.

In summation, Ellis's counsel again addressed the issue:

> I acknowledge that the difficulty I have labored under is that you cannot show clearly a damage to the central nervous system. Nobody can, but that doesn't mean you don't have a right to be treated fairly when you have it.

Maritime Overseas' counsel stressed in summation:

> There wasn't a single article out of all the articles that we all went over bit by bit, line by line. Not a single one ever says that diazinon causes these sort of effects [*i.e.*, neurotoxicity]. Not one.
>
> * * *
>
> There's an article and it's Defendant's Exhibit No. 3. I want you to look on page 149 of that article, in particular. It's an article written by Al Johnson together with Dr. Lassetor and two other people. And one of the conclusions of that article is that

> pesticides – some pesticides have neurotoxic effects, yes. It doesn't mention diazinon. . . . And the reason is because all organophosphates are different. Some are nerve gas, some kill people, some are insecticide. There's not a single article anywhere that says diazinon causes these effects.
>
> * * *
>
> We have never taken the position that Mr. Ellis did not have acute symptoms due to exposure of the diazinon. Where the case differs and where we differ from the plaintiff is whether Mr. Ellis's current complaints are a result of the exposure to diazinon. Does he have long-term, delayed neurotoxicity as a result to the exposue to the diazinon. *That's the key issue in this case. All these other issues that you have to answer, especially the ones relating to damages, to medical expenses, to loss of wages, it all falls from that decision that you have to make.*
>
> * * *
>
> We have had article after article referred to, that have all been discussed, organophosphate poisoning and the effects of organophosphate poisoning. We've tried to show – and I've been accused of nitpicking for doing it – that each article relied on . . . doesn't support a determination that exposure to diazinon does cause long-term delayed neurotoxicity, period. It didn't support it. And what the plaintiff has tried to do is say the literature talks about organophosphate exposure, diazinon is an organophosphate, therefore this has got to be it . . . .

(Emphasis added.)

The Court states that to determine now whether Maritime Overseas' scientific evidence was unreliable "would base appellate review on a record that was not made." *Ante* at ____ [App. A-15]. That simply is not true. Maritime Overseas did not ambush Ellis on the substance of the expert testimony. The record shows that it was, in counsel's words, "the key issue" in the case. The parties purported

to present all available evidence on the issue whether diazinon could cause neurotoxicity. This is not a case where a party could have offered more or different scientific evidence had it known that its opponent objected to the evidence as unreliable. Maritime Overseas reasserted its contentions in its motion for new trial and on appeal. There can be no question that Maritime Overseas challenged the reliability of Ellis's scientific evidence.

D

The Court does not attempt to argue that Ellis's evidence had any probative value. It holds that even if the evidence had no probative value, it must be considered some evidence to support the judgment on appeal if it was not objected to. This holding is squarely contrary to *Schaefer, Crye, Havner,* and the other cases I have cited. The Court has two responses.

First, the Court says that to allow an argument that scientific evidence admitted without objection was nevertheless unreliable and non-probative would "take away the trial court's gatekeeping function" and thus would:

> usurp the orderly and efficient disposition of appeals, deprive the proffering party of an opportunity to cure any defects in its evidence that the objecting party might pose, and in some cases, place appellate courts in the undesirable position of making decisions about evidentiary reliability absent a fully developed record.

Ante at ____ [App. 16]. Of course, none of these evil effects is present in this case. Ellis not only understood Maritime Overseas' position and had every opportunity to cure the defects in his evidence, he and Maritime Overseas purported to offer all the evidence in existence on whether diazinon can cause neurotoxicity. There can be no question in this case that the record was fully developed. To say that a review of the sufficiency of evidence admitted without objection deprives the trial court of its gatekeeping function is to say that *Schaefer, Crye,* and *Havner* were wrongly decided. In *Schaefer,* for example, a physician testified, just as in the present case, that the

plaintiff's injury was caused by a particular agent. Defendant did not object to this testimony. Still, this Court held that the evidence had no probative value because there was nothing in the record to indicate that the injury could have occurred as the witness testified. The witness's mere opinion was not enough to support a judgment. The same situation is present in this case, except that here the parties clearly made every effort to produce all available evidence, whereas that is not at all clear in *Schaefer.*

Second, the Court says that the cases I have cited—it refers to none of them by name—are distinguishable because "those cases involve no evidence challenges where, on the face of the record, the evidence lacked probative value. . . . In contrast, by its own admission, Maritime is not making a no evidence complaint." *Ante* at ____ [App. A-18]. I have already explained that Maritime Overseas' complaint is really that there is no evidence of some damages, and that the Court's effort to categorize Maritime Overseas' position more rigidly is unfair to the arguments made in its briefs. But assume that all the cases I have cited involved no-evidence challenges and that this case does not. What possible difference can that make to the Court? Why is the necessity of objection to the evidence less important when the appellate complaint is no evidence? As the Court's own authority, *Sumitomo Bank*, points out, the necessity of objection is more important when the complaint is that there is no evidence to support a judgment and therefore judgment should be rendered in the complainant's favor. When the request is only for a new trial, a reassessment of evidence admitted without objection is "acceptable". *Sumitomo Bank*, 717 F.2d at 218. Moreover, the trial court's gatekeeping function which the Court argues must be preserved is "take[n] away", *ante* at ____ [App. A-16], just as effectively in a no-evidence appeal.

The Court's attempts to distinguish *Havner, Crye, Schaefer,* and the long line of cases that precedes them are flawed.

E

The use of scientific evidence at trial poses unique problems. Sometimes, as in *Havner,* the entire body of evidence is unreliable from a scientific viewpoint. At other times, as in *Crye* and *Schaefer,* the evidence is unreliable because it is based on assumptions that

cannot be demonstrated. In still other cases, like this one, the evidence is unreliable only as it pertains to a part of the claims. For the most part, I agree with the Court that the issue of the reliability of scientific evidence should be raised in the trial court. The exception is when the evidence is plainly lacking in probative value – the moon is made of green cheese. But it is not at all clear what procedures should be used to raise reliability challenges. The Court refers to motions in limine, although as a general rule rulings on such motions do not preserve error. The Court also refers to summary judgments, although this procedure may not work well when testimony is important to illuminate the issue. The Court insists that there be an objection, but *Havner* shows the difficulty of objecting to an entire case. Moreover, once the issue has been identified, why should further objection be necessary?

For over two years, the Supreme Court Advisory Committee, which advises the Court on all rules of procedure, and the State Bar of Texas Committee on the Administration of Rules of Evidence, which monitors the operation of the Rules of Evidence, have tried to fashion rules governing the timing and manner of objections to scientific evidence. The seventy-plus members of these highly respected committees have broad experience and expertise in procedural and evidentiary matters. Last fall the Advisory Committee, after considering the work of the State Bar Committee, concluded that the problem of how and when to object to scientific evidence is complex and involves many difficult considerations. The Advisory Committee recommended to this Court that any rules await a development of the issues in appellate opinions carefully analyzing the various concerns. That counsel seemed sound at the time, but today's confusing opinion makes the alternative of a rules solution far more appealing.

In simply mandating an objection before or during trial, the Court appears oblivious to the considerations its advisory committees believed to be complex and difficult. The Court's analysis is really confined to a single thought: parties should not be "ambushed". That relatively innocuous proposition simply cannot support the addition to our procedural jurisprudence of a vague and universal duty to object to scientific evidence before or during trial.

III

Maritime Overseas' challenge to Ellis's scientific evidence is valid. Although Ellis's experts testified that Ellis's exposure to diazinon caused neurotoxicity, there was no basis for their opinions in any scientific literature or experimentation. The experts reviewed all the literature regarding neurotoxicity from exposure to pesticides in general and organophophates in particular; none was omitted. Nowhere in the literature is there any demonstration that diazinon causes neurotoxicity.

Ellis's position is that diazinon is an organophosphate, some organophosphates cause neurotoxicity (although some do not), and therefore diazinon causes neurotoxicity. The logical fallacy in this syllogism is apparent. The record establishes that no scientific evidence exists for concluding that diazinon is among the organophosphates that causes neurotoxicity or among those that do not. There is simply no way to tell.

In *Havner*, plaintiffs offered extensive epidemiological evidence showing a relationship between Bendectin and birth defects, but the relationship was never shown to be statistically significant. We held that that was no evidence to support a finding that Bendectin causes birth defects. The evidence in the present case is even weaker than the evidence in *Havner*. Here there is no evidence at all, other than Ellis's experts' bare opinions, showing a relationship between diazinon exposure and neurotoxicity. Moreover, all physical medical evidence—electroencephalograms, peripheral nerve tests, an MRI, and a CAT scan—have shown Ellis to be in normal health, aside from problems relating to obesity, high blood pressure, smoking, and alcohol dependency. Under our precedents, the experts' unsupported opinions cannot provide a basis for a judgment against Maritime Overseas.

* * * * *

Because there is no basis for Ellis's experts' opinions that his exposure to diazinon caused him to suffer from neurotoxicity, those opinions were not probative evidence and should not have been considered by the court of appeals in assessing the factual

sufficiency of the evidence of causation of Ellis's damages. Accordingly, I would reverse the court of appeals' judgment and remand the case to that court to redetermine the factual sufficiency of the evidence.

NATHAN L. HECHT
Justice

OPINION DELIVERED: April 16, 1998

APPENDIX B

IN THE SUPREME COURT OF TEXAS

No. 94-1057

MARITIME OVERSEAS CORPORATION,
Petitioner,

v.

RICHARD ELLIS,
Respondent.

On Application for Writ of Error to the Court of Appeals for the Fourteenth District of Texas

JUDGMENT

THE SUPREME COURT OF TEXAS, having heard this cause on writ of error to the Court of Appeals for the Fourteenth District, and having considered the appellate record and the argument of counsel, is of the opinion that the judgment of the court of appeals should be affirmed.

IT IS THERE ORDERED, in accordance with the Court's opinion, that:

1) The judgment of the court of appeals is afffirmed;

2) Richard Ellis shall recover from Maritime Overseas Corporation, which shall pay the costs in this Court and in the court of appeals.

A copy of this judgment and of the Court's opinion is certified to the Court of Appeals for the Fourteenth District and to the District Court of Harris County, Texas, for observance.

(Opinion by Justice Baker, joined by Justice Enoch, Justice Spector, Justice Abbott, and Justice Hankinson)

(Concurring opinion by Justice Gonzalez, joined by Justice Abbott in Part III only)

(Dissenting opinion by Justice Hecht, joined by Chief Justice Phillips)

(Justice Owen not sitting)

April 16, 1998

****

APPENDIX C

RE: Case Number 94-1057
Court of Appeals Number: C14-91-00795-CV
Trial Court Number: 83-42067

Style: MARITIME OVERSEAS CORPORATION
v.
RICHARD ELLIS

Dear Counsel:

Today, the Supreme Court of Texas overruled the motion for rehearing, as supplemented, in the above referenced cause. Justice Owen not sitting.

Sincerely,

John T. Adams, Clerk
by Courtland Crocker
Deputy

Filed July 3, 1998

cc The Honorable Olen Underwood

APPENDIX D

RE: Case Number 94-1057

Style: MARITIME OVERSEAS CORPORATION
v.
RICHARD ELLIS
From *Harris* County, *Fourteenth* District

Dear Counsel:

Today, the Supreme Court of Texas (Justice Owen not sitting) granted the motion for rehearing of application for writ of error in the above styled cause. The order of this Court of 15 November, 1996, denying application for writ of error is withdrawn, and the application for writ of error is granted on Points of Error Nos. **1 & 2**. (Dissenting opinion on granting of motion for rehearing by Justice Cornyn,[1] joined by Justice Spector, Justice Baker, and Justice Abbott) The motion to expedite denial of motion for rehearing is dismissed as moot. This cause has been set for submission and oral argument on Wednesday, **5 November, 1997**. . . .

Sincerely,

John T. Adams, Clerk
by Courtland Crocker
Deputy

Filed July 9, 1997

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[1] Justice Cornyn dissented on grounds relating to judicial administration as opposed to any substantive issue in the application.

APPENDIX E

RE: Case Number 94-1057
Style: MARITIME OVERSEAS CORPORATION
v.
RICHARD ELLIS

Dear Counsel:

Today, the Supreme Court of Texas denied the above referenced application for writ of error, as supplemented, with the notation "Writ Denied". Motion to expedite was dismissed as moot. Dissenting Opinion by Justice Hecht on denial of application for writ of error. (Justice Owen not sitting.)

Sincerely,

John T. Adams, Clerk
by Michael C. Murphey, Deputy

Filed Nov. 15, 1996

IN THE SUPREME COURT OF TEXAS

No. 94-1057

MARITIME OVERSEAS CORPORATION, PETITIONER

v.

RICHARD ELLIS, RESPONDENT

ON APPLICATION FOR WRIT OF ERROR TO THE
COURT OF APPEALS FOR THE FOURTEENTH DISTRICT OF TEXAS

Opinion Dissenting From Denial of Application for Writ of Error

JUSTICE HECHT, dissenting from the denial of application for writ of error.

JUSTICE OWEN did not participate in the decision.

By any standard I know of, the application for writ of error in this case should be granted. Consider this:

- The size of the damage award—over $8.5 million—certainly makes the case significant to the parties, a seaman and his employer.
- The central legal issue—what evidence is necessary to support lilability in a toxic tort case—is unquestionably important to our jurisprudence. Each year in this state the issue recurs in hundreds of cases involving millions of dollars. Yet the issue has not been authoritatively addressed; it is, to quote the court of appeals, "one of first impression" in this state. 886 S.W.2d 780, 782 (Tex. App.—Houston [14th Dist.] 1994) (en banc).
- The issue is debated nationally by courts and commentators. *See, e.g., Daubert v. Merrell Dow, Inc.*, ____ U.S. ____, 113 S. Ct. 2786, 2798, 125 L. Ed. 2d 469, ____ (1993): *Brock v. Merrell Dow Pharmaceuticals, Inc.* 874 F.2d 307, 310 (5th Cir.), *modified*

on reh'g, 884 F.2d 166 (5th Cir. 1989), *cert. denied*, 494 U.S. 1046, 110 S. Ct. 1511, 108 L. Ed. 2d 646 (1990); *Christopherson v. Allied-Signal Corp.*, 939 F.2d 1106 (5th Cir. 1991), *cert. denied*, ____ U.S. ____, 112 S. Ct. 1280, 117 L. Ed. 2d 506 (1992); PETER W. HUBER, GALILEO'S REVENGE: JUNK SCIENCE IN THE COURTROOM (1991).

- The issue has engendered dissents and conflicts in the courts of appeals. The appellate court panel's 2-1 opinion in this case was reversed by the court en banc, 5-2. 886 S.W.2d 780. The court noted that its decision conflicted with a unanimous panel opinion of another court. *Id.* at 785-786. The latter opinion was itself reversed by the other court en banc, 5-1. *Merrell Dow Pharmaceuticals, Inc. v. Havner*, 907 S.W.2d 535, 548-564 (Tex. App.—Corpus Christi 1994)(en banc), *rev'g* 907 S.W.2d 535, 539-548 (panel opinion).
- This Court has granted the application for writ of error in *Havner*, which, as noted, involves a similar issue. 39 TEX. SUP. CT. J. 237, No. 95-1036 (Feb. 9, 1996). That case was argued earlier this year and remains before us pending decision. If nothing else, the Court should hold the present case for the decision in *Havner*.
- The case has been well briefed by very capable counsel. Plaintiff is represented by John M. O'Quinn of O'Quinn, Kerensky, McAninch & Laminack; Joe H. Reynolds of Andrews & Kurth; and Eugene A. Cook and Gael Plauché of Bracewell & Patterson. (Mr. Reynolds' association with the case for the first time shortly before JUSTICE OWEN'S departure from Andrews & Kurth to assume her seat on this Court disqualifies her from participating in the consideration of the case.) Defendant is represented by Linda Broocks of Ogden, Gibson, White & Broocks; Thomas B. Greene, III of Ware, Snow, Fogel, Jackson & Greene; and Joe R. Greenhill, Jane Nenninger Bland, Marc A. Antonetti, and Margaret Niver McGann of Baker & Botts.

The only relevant consideration omitted from this list is whether the court of appeals' decision was incorrect. I am inclined to think it was, as I shall explain momentarily, although I would not want to make that decision without the benefit of argument and plenary consideration of the case. But even if the court of appeals were correct—a matter that at very least is in some doubt, as shown by the dissents in the court of appeals—that factor alone could not outweigh the others. We almost always hear cases as significant as

this one irrespective of whether the lower court's decision was wrong. (Take for example *Maple Run at Austin Municipal Utility District v. Monaghan*, ____ S.W.2d ____ (Tex. 1996), decided within the past month, in which the Court unanimously affirmed the district court's decision on direct appeal. Or take *Continental Airlines, Inc. v. Kiefer*, 920 S.W.2d 274 (Tex. 1996), in which the Court unanimously affirmed the court of appeals' judgment.)

The present case is, in so many words, a Supreme Court case. If another case in the past eight years so deserved to be heard and yet was denied, I do not recall what it was. Why, then, are there not the requisite four votes to grant the application for writ of error? I cannot say, for two reasons. First, I simply do not know why some of my colleagues have chosen not to vote to grant the application in this case because they have not told me (they are not obliged to, of course), and it would be inappropriate for me to speculate as to their motives. Second, I cannot divulge the explanations some have offered because the Code of Judicial Conduct makes the Court's deliberations secret. *See* TEX. CODE JUD. CONDUCT, Canon 3, part B(11)(1996), *reprinted in* TEX. GOV'T CODE ANN. Title 2, subtitle G, app. B (Vernon Supp. 1996) ("The discussions, votes, positions taken, and writings of appellate judges and court personnel about causes are confidences of the court and shall be revealed only through a court's judgment, a written opinion or in accordance with Supreme Court guidelines for a court approved history project."). Any Justice could explain his or her position, just as I am doing here; none chooses to do so.

There are many reasons to vote to deny an application, and the MEMBERS of the Court often disagree. Most of the time my impression is that any Justice would be able to give a public explanation for his or her vote and would be willing to do so if the press of other cases were not so great. Sometimes, however—and I say this very, very reluctantly—the explanation for a vote would appear to lack much substance in the light of public scrutiny. If our votes on applications were always public, some would change. In this case, I believe the votes would have been different had they been public. The confidentiality of an appellate court's deliberations serves several good purposes; changing the outcomes of cases and evading individual accountability for our decisions are not among them. I am forced to conclude that the time has come for the Court to make public its votes on applications.

The facts of the case are relatively simple. While cleaning diazinon, a pesticide, out of a ship's pantry, seaman Richard Ellis was exposed for five hours to 100-200 times the level of the chemical considered safe. As a result, he experienced nausea, headaches, and eye problems. When, after two days, the ship put into port, Ellis was treated at a hospital and released. Ten months later Ellis sued his employer, Maritime Overseas Corporation, alleging that he was suffering delayed permanent neurotoxicity from his exposure to the diazinon causing eye problems, trouble sleeping, depression, anxiety, irritability, headaches, memory problems, high blood pressure, muscle weakness, and gastrointestinal problems. Ellis claimed damages under the Jones Act, 46 U.S.C App. § 688 (1994), and under general maritime law for unseaworthines of the vessel on which he was injured. Maritime Overseas does not dispute that Ellis suffered from acute overexposure to diazinon; it denies, however, that Ellis suffered any permanent injury from the exposure.

Nearly eight years after Ellis filed suit, the case was tried. (The case was tried before Judge Ken Harrison about the time ethics charges were raised concerning his conduct in other cases, which later forced his resignation. Stephanie Asin, *Harrison Resigns Amid Alleged Ethics Violations – Commission Drops Charges, Inquiry,* HOU. CHRON., July 10, 1992, at 25; *Attorney Investigated Over Fees Approved by Civil Court Judge,* HOU. CHRON., March 12, 1991, at 15.) The jury found that Maritime Overseas' negligence caused Ellis' injury and assessed $8,576,000 actual damages as follows:

Loss of past earning capacity	$ 320,000
Loss of future earning capacity	1,890,000
Past medical expenses	38,000
Future medical expenses	850,000
Past pain and mental anguish	228,000
Future pain and mental anguish	4,000,000
Past physical impairment	250,000
Future physical impairment	1,000,000

The jury also awarded $1,000,000 exemplary damages for gross negligence and another $1,000,000 exemplary damages for Maritime Overseas' willful refusal to pay Ellis maintenance and cure. The district

court rendered judment on the verdict, including prejudgment interest, for a total of $12,447,728.

A divided panel of the court of appeals reversed and rendered judgment for Maritime Overseas, holding that there was no evidence to support Ellis' claim that he suffered delayed neurotoxicity from his exposure to diazinon. The panel consisted of Justices Robertson, Junell, and Draughn. Justice Draughn noted his dissent without opinion. The day after the decision was handed down, Justice Junell retired and was replaced on the court by Justice Bowers. The court then determined to rehear the case en banc. Chief Justice Brown recused, and before a decision could issue, Justice Bowers died. The seven Justices on the en banc court then divided 5-2, Justices Sears, Cannon, Ellis, and Lee joining Justice Draughn, and Justice Murphy joining Justice Robertson. The majority reversed the awards of exemplary damages and prejudgment interest and affirmed the remainder of the judgment for actual damages.

Maritime Overseas's principal complaint on appeal is that while Ellis' overexposure to diazinon undoubtedly caused an acute reaction for which he was successfully treated, there was no *probative* evidence that diazinon did or even *could* cause his alleged delayed neurotoxicity. This is not to say that there was no testimony at all that diazinon caused the permanent injuries Ellis claimed: to the contrary, his expert witnesses said so. Maritime Overseas contends, of course, that Ellis' experts were wrong, and Maritime Overseas' own experts so testified. All this testimony is summarized in the court of appeals' opinions. 886 S.W.2d at 787-791, 804-807. The credibility of the experts as witnesses was a matter for the jury to decide and is not the subject of Maritime Overseas' no-evidence complaint on appeal. Rather, Maritime Overseas' argument is that Ellis' experts' testimony was not probative, as is must be to support recovery of damages, because it had no basis in fact.

Excluding the conflicting opinions of the trial experts, the scientific evidence on the long-term effects of diazinon appears to be essentially undisputed. Diazinon is an organophosphate. Exposure to some organophosphates—malathion and parathion, in particular—has been shown to cause long-term neurological effects in rats. Exposure to other organophophates—e.g., adenine triphosphate (ATP)—does not. ATP occurs naturally in the human body and is

needed for metabolism. There was no evidence at trial of any study showing that diazinon causes delayed neurotoxicity in humans or any other animals. But likewise, there was no evidence at trial of any study showing the contrary, that diazinon does not cause delayed neurotoxicity. Each opinion at trial concerning the long-term effects of exposure to diazinon – from Ellis' and Maritime Overseas' experts, alike – was based solely on the expert's qualifications and experience. There is nothing approaching hard fact to support either side.

The burden of proof, of couse, is on the plaintiff. The central issue in this appeal, then, is whether a plaintiff can prove tort liability with an expert opinion based on nothing more than the witness' education and experience. In some contexts, such evidence is clearly not probative. For example, no hypothesis science has *dis*proved could ever support a judgment. To take an extreme case, no recovery for personal injuries suffered in sailing off the edge of the world will be affirmed on appeal, no matter how many witnesses testified at trial that the world is flat, or how educated and experienced they claimed to be, or whether the jury chose to believe them. Even when science can demonstrate only that a theory is most unlikely, I doubt that it would be considered on appeal to be probative evidence in support of recovery. In this case, had there been evidence at trial of studies demonstrating as conclusively as science can that diazinon does not cause delayed neurotoxicity, I doubt seriously a judgment for Ellis would have survived appeal. The deficit in Ellis' expert testimony would be apparent.

The real difficulty is when science has not come to a firm conclusion. On the one hand, the legal system does not require that claims resting on scientific evidence fail if the evidence is anything but certain. On the other hand, the law cannot impose liability based on evidence that science itself would never take very seriously. Saying a thing does not make it so, however well-degreed the speaker may be, and however credible he may seem to a jury. There must be more to proof than this, even in a Jones Act case, in which the burden of proof is very light.

I do not suggest that there is a ready solution to this quandary. These issues divided the appellate court panel 2-1, then the court en banc 5-2. The court expressed its disapproval of the panel opinion of another court of appeals in *Merrell Dow Pharmaceuticals, Inc. v. Havner*, 907 S.W.2d 535, 539-548 (Tex. App.–Corpus Christi 1994),

which involved a similar issue. The unanimous panel opinion in *Havner* was later reversed by a divided en banc court 5-1, after one justice on the panel had retired and another changed positions. We granted application for writ of error. 39 TEX. SUP. CT. J. 237, No. 95-1036 (Feb. 9, 1996). My point is simply that we need argument as much in the present case as we do in *Havner.*

In my view, it verges on irresponsibility for this Court to refuse to give plenary consideration to an issue of such consequence. Issues that stir controversy in and among courts of appeals beg to be resolved, particularly where, as here, the issue is crucial in hundreds of cases litigated each year. Even if a majority of this Court believes that the judgment of the court appeals was correct, it should say so and resolve the controversy that will continue unabated until it does.

Today the court granted the applications for writ of error in three cases, and the motions for leave to file petitions for writ of mandamus in two cases. The issue in *Worthy v. Collagen Corporation*, No. 96-0675 (opinion below at 921 S.W.2d 711 (Tex. App.—Dallas 1995)), is whether state law injury claims for collagen implants are preempted by the Medical Device Amendments to the Federal Food, Drug, and Cosmetic Act, 21 U.S.C.A. §§ 360c-360*l* (West Supp. 1995), after *Medtronic, Inc. v. Lohr*, ____ U.S. ____, 116 S. Ct. 2240, 135 L. Ed. 2d 700 (1996). The issue in *Grain Dealers Mutual Insurance Company v. McKee*, No. 96-0022 (opinion below at 911 S.W.2d 775 (Tex. App.—San Antonio 1995)), is whether a corporation's automobile liability insurance policy covers the president's daughter. In *Williams v. Olivo*, No. 96-0044, (opinion below at 912 S.W.2d 319 (Tex. App.—San Antonio 1995)), the issue is whether a landowner is liable for injury suffered by a well-driller's employee who fell on a drill pipe thread protector. The issue in *Aramark Uniform Services, Inc. v. Tyson*, No. 96-0481 (mandamus; no published opinion below), is whether a plaintiff is required to make a prima facie showing of entitlement to exemplary damages before discovering evidence of defendant's net worth. The issue in *X.L. Insurance Company v. Mehaffy*, No. 96-0583 (mandamus; opinion below at 918 S.W.2d 687 (Tex. App.—Beaumont 1996)), is whether one of plaintiff's insurers is required to arbitrate a contribution claim against another of plaintiff's insurers if the only agreement for arbitration is between plaintiff and the other insurer.

While the issues in these cases are significant, both to the parties

and to our jurisprudence, none of these cases is any more significant than the present case. Five votes were required to hear the mandamus cases; four votes were required to hear the others. Why were these cases granted and the present case denied? I cannot answer, partly because I do not know, and partly because I cannot say. I do not know what has motivated all of my colleagues because a Justice is not required to give a reason for refusing to vote for an application. What some have said to me is confidential, although they are free to write as I have. I do not intend in any way to impugn the motives of other Justices. I have become convinced, however, that if each of the eight Justices participating in the decision had been constrained to explain his or her position publicly, the vote would have been different, and the application would have been granted.

I am fully aware of the benefits of confidentiality in appellate deliberations. Justice (now Chief Justice) William H. Rehnquist has summarized them thus: "candor on the part of the participants, full preparation [because no staff member is present to assist the justice on the U.S. Supreme Court—but this Court usually has staff members present], and a reasonable degree of harmony". William H. Rehnquist, *Sunshine in the Third Branch*, 16 WASHBURN L.J. 559, 567 (1977). To these may be added the burden of offering explanations in more cases when the Court already has plenty to do. CHIEF JUSTICE PHILLIPS has written an eloquent defense of the Court's practice not to announce the votes on applications that are denied, and an argument for not dissenting from such votes. *Dallas Morning News v. Fifth Court of Appeals*, 842 S.W.2d 655, 661-663 (TEX. 1992) (separate opinion). While I have the utmost respect for CHIEF JUSTICE PHILLIPS' views on this subject, the premise of his arguments, I think, is that Justices would not mind explaining their votes publicly if only the press of other business would allow but should not be forced to do so at the expense of opinions in cases granted. His arguments are valid only as long as the premise is valid. If instead a public announcement of the votes on applications that are denied would make Justices more deliberate and accountable in their consideration of those applications, then it seems to me the practice would do great good.

Surely none of the legitimate purposes of confidentiality justifies voting one way if the vote is not announced publicly and another way if it is. Confidentiality is intended to facilitate the work of an appellate court, not determine the outcomes of cases. The decision in a case

ought never to turn on the fact that individual Justices are not obliged to explain their positions.

There is much less need for confidentiality in the votes on applications than in other aspects of the Court's deliberations. Appellate judges must have an opportunity to explore ideas with each other before taking public positions. I can scarcely imagine conducting our deliberations in the same environment as the Legislature, for example. But the need for candor in deliberations does not justify a lack of accountability in our decisions. This idea is neither novel nor renegade. Justice Willilam O. Douglas discussed his views on the subject in his autobiography:

> When I came on the Court [in 1939] Hugo Black talked to me about his idea of having every vote on every case made public. In cases taken and argued, the vote of each Justice was eventually known. But in cases where appeals were dismissed out of hand or certiorari denied, no votes were recorded publicly. I thought his idea an excellent one and backed it when he proposed to the conference that it be adopted. But the requisite votes were not available then or subsequently. As a result he and I started to note our dissents from denials of certiorari and dismissal of appeal in important cases. Gradually the practice spread to a few other Justices; and finally I ended up in the sixties noting my vote in all cases where dismissals or denials were contrary to my convictions.

WILLIAM O. DOUGLAS, GO EAST [sic] YOUNG MAN 452 (1974), *quoted in* COMMISSION ON REVISION OF THE FEDERAL COURT APPELLATE SYSTEM, STRUCTURE AND INTERNAL PROCEDURES: RECOMMENDATIONS FOR CHANGE 113 n.2 (1975). Professor Karl Llewellyn has written:

> It is as well to remember that neither secrecy of the court's deliberation or later secrecy about what went on during that deliberations rests in the nature of things or in any ordinance of God. The roots of each are either practical or accidental, and it is only either ignorance or tradition which makes us feel that we have here something untouchable, a semiholy arcanum. We tend to forget that in common law history the centuries of the Year Books rest on a practice of conference, consultation, and

> decision going on in open court before ears and eyes of counsel, the bar at large, and the apprentices . . . . I personally suspect that our own secrecy practice began when decision began to be postponed beyond the close of argument, with an eye to avoiding misapprehension and disappointment, and then to avoiding financial speculation. And I suspect the carryover into later secrecy about past deliberations to represent partly a closing of ranks to protect the court from criticism or attack, and in later years a similar closing to allow free discussion with no possible repercussions in a re-election campaign. Thus the storied sanctity of the conference room represents to me as pragmatic and nonmystic a phase of appellate judicial work as the handling of the docket. Our modern fetish of secrecy reminds me of the shock German lawyers displayed at the notion of such dangerous things as published dissenting opinions.

KARL N. LLEWELLYN, THE COMMON LAW TRADITION–DECIDING APPEALS 324 n.308 (1960) (citation omitted), *quoted in* Arthur S. Miller & D. S. Sastri, *Secrecy and the Supreme Court: On the Need for Piercing the Red Velour Curtain*, 22 BUFFALO L. REV. 799, 809-810 (1973).

I recognize the danger that publicly announcing votes on denied applications could lead an unscrupulous Justice to posturing for ulterior reasons. And I believe that CHIEF JUSTICE PHILLIPS' concern that the Court's time and resources not become too strained is valid. I believe that maintaining the confidentiality of votes on denied applications is generally the preferable approach. But when it allows decisions in cases which would not be made if public explanations were required, confidentiality becomes indefensible.

I would grant the application for writ of error in this case, set oral argument, and resolve the important issues presented after plenary consideration of the merits. To ensure accountability in our decisions, the Court should announce the votes to grant and those to deny in this and all other cases in which relief is denied.

Nathan L. Hecht
Justice

OPINION DELIVERED: November 15, 1996

APPENDIX F

MARITIME OVERSEAS CORPORATION, APPELLANT,

v.

RICHARD ELLIS, APPELLEE.

No. C14-91-00795-CV.

Court of Appeals of Texas,
Houston (14th Dist.).

JULY 28, 1994

CORRECTED MAJORITY OPINION ON
MOTION FOR REHEARING EN BANC

DRAUGHN, Justice.

In this Jones Act, general maritime case, the trial court after a jury verdict entered judgment for personal injury damages to Richard Ellis. Appellant, Maritime Overseas Corporation, in fifteen points of error, raises legal and evidentiary challenges to the actual and punitive damages awarded, and to the exclusion of certain evidence. We affirm the judgment in part and reverse and render in part.

The central issue in this case is one of first impression because it requires us to examine the issues of causation and damages as to a toxic tort in the context of a Jones Act, General Maritime case tried in state court. To assist us in our determination, we have been favored with outstanding legal briefs, oral arguments, and developing case law by both parties. From these and the record, it is clear that an essential part of our appellate task, is to examine the standard for reviewing the weight and credibility of expert witness testimony under federal and state law. To properly review this and the other evidentiary issues raised, we must first place them in the relevant factual setting.

Appellee was a steward's assistant aboard the S/T OVERSEAS ALASKA. On August 27, 1982, the chief steward, in order to combat a roach problem, sprayed an industrial strength pesticide, Diazinon, in the galley, pantry, and dry storeroom without diluting it at the proper

ratio of fifty parts water to one part concentrate. It was excessively applied by the chief steward in a small enclosed pantry room which had no ventilation and other nearby areas. The next morning, crew members noticed a strong odor of insecticide, and when the captain learned of this misapplication, he ordered the pantry and other areas to be cleaned so as to remove the chemical. Appellee participated in this clean-up for approximately five hours without being furnished any inhalation protective gear, nor any gloves or other gear to protect his hands, arms, or other skin areas from contact with the insecticide. Expert testimony would later reflect that appellee was exposed to levels of 100 to 200 times that considered safe for human exposure. Subsequent to this intense exposure, appellee began experiencing symptoms of nausea, headache, and eye problems. When the ship reached port in New Orleans two days later, appellee recieved treatment at the New Orleans General Hospital emergency room.

The hospital records showed a diagnosis of organophosphate exposure with findings of myosis with pupil constriction, muscle twitching and muscle weakness along with other symptoms. Diazinon is a member of this family of chemical compounds known as organophosphates, which have been shown to be toxic to humans in varying degrees. The emergency room doctor testified later that on a scale of 1 to 10, with 10 representing death and 1 as completely normal, appellee suffered organophosphate exposure at a level of 6 to 7. During this initial visit to the hospital, appellee was given blood tests which reflected that his blood and serum levels of an essential enzyme, acetylcholinesterase, also called cholinesterase, was below normal. Cholinesterase is essential to the human nervous system because it enables messages to be transmitted normally from one nerve to another. Appellee's red blood cell level of cholinesterase was .40, while the average range for men of appellee's age is .44 to 1.09. His serum level of cholinesterase was .53 or .54, while the average range is 1.90 to 3.80. Later expert testimony concluded that these clinical findings and other symptoms reflected neurotoxic nerve impairment and damage from organophsphate poisoning. However, appellee was not hospitalized at New Orleans General Hospital. He was given medication for eye problems and advised to return for a follow-up visit. He returned to his ship and continued to experience problems. One month later he saw another doctor for continuing problems with

his eyes. He continued to work as a crew member for the remainder of 1982.

In June 1983, appellee filed suit against appellant under the Jones Act, 46 U.S.C.A. § 688 (1988)[1] alleging gross negligence, and under general maritime law alleging unseaworthiness. Appellee claimed that he was suffering from delayed neurotoxic effects caused by the exposure to Diazinon. Appellee's deposition testimony and the testimony regarding his medical records indicate that appellee continued to suffer from eye problems, that he had trouble sleeping, that he was depressed, anxious, and had memory problems, that he had high blood pressure, and that he suffered gastrointestinal problems. Appellee's wife testified that appellee was depressed, more irritable, had headaches, muscle weakness, memory problems, and had been unable to hold a job.

The jury found in favor of appellee on both claims and awarded appellee approximately $8,576,000.00 in acutal damages, $1 million in punitive damages, and $1 million in exemplary damages for failure to pay maintenance and cure. The trial court awarded appellee an additional $1,871,728.00 in prejudgment interest, making a total of approximately $12.6 million.

In point of error one, appellant contends the trial court erred in denying appellant's motion for a new trial because there is insufficient evidence to support the jury finding that appellee suffered $8,576,000.00 in actual damages. Appellant concedes that appellee

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[1] The Jones Act provides:

Any seaman who shall suffer personal injury in the course of his employment may, at his election, maintain an action for damages at law, with the right of trial by jury, and in such actions all statutes of the United States modifying or extending the common-law right or remedy in cases of personal injury shall apply; and in cases of death of any seaman as a result of any such personal injury [sic] the personal representative of the seaman may maintain an action for damages at law with the right of trial by jury, and in such action all statues conferring or regulating the right of action for death in the case of railway employees shall be applicable. . . .

suffered short-term effects from the exposure to Diazinon and, in effect, that overexposure to Diazinon is toxic to humans and can cause damage to the nervous system on some temporary basis. Thus, appellant does not contest damages for the medical treatment appellee received in New Orleans in 1982 or for the loss of two days of work. Appellant does contest damages awarded for appellee's claim of delayed and permanent neurotoxic damage on the ground that appellee's expert testimony was speculative and not based on reasonable medical probability. Essentially, appellant's attack is directed at the issue of causation as to the delayed and permanent damage found by the jury based on the circumstantial and expert evidence before them.

Before examining the expert evidence challenged by this point, the parameters of our appellate review should be examined. It is axiomatic that a trial court has wide discretion in granting or denying a motion for new trial. *Champion Int'l Corp. v. Twelfth Court of Appeals*, 762 S.W.2d 898, 899 (Tex. 1988). We must uphold the trial court's decision absent a showing of a manifest abuse of discretion. *Id.* Because appellant contends there was factually insufficient evidence to support the award of damages, we must consider, but not necessarily detail in this opinion, all of the evidence both supporting and contrary to the judgment. *Plas-Tex., Inc. v. United States Steel Corp.*, 772 S.W.2d 442, 445 (Tex. 1989); *Pool v. Ford Motor Co.*, 715 S.W.2d 629, 635 (Tex. 1986). We may set aside the verdict only if the evidence is too weak to support the damages, or if the finding is so against the overwhelming weight of the evidence that it is manifestly unjust and clearly wrong. *See Garza v. Alviar*, 395 S.W.2d 821, 823 (Tex. 1965). The applicable standard is determined by which party has the burden of proof on the challenged issue. *Raw Hide Oil & Gas v. Maxus Exploration*, 766 S.W.2d 264, 275 (Tex. App.—Amarillo 1988, writ denied).

Appellant asserts that we must apply federal law to this case because appellee's causes of action are both federal causes of action. The Texas supreme court has stated:

> Where applicable *and* properly invoked, general maritime law preempts state causes of action and remedies, consistent with the long standing desire of Congress and the judiciary to achieve uniformity in the exercise of admiralty jurisdiction.

Texaco Refining & Marketing v. Estate of Dau Van Tran, 808 S.W.2d 61, 64 (Tex. 1991), *cert. denied*, 112 S.Ct. 301 (1991). In *Texaco*, the court was determining whether a plaintiff could recover mental anguish damages, allowed under state law, but prohibited under general maritime law. *Id.* at 63. Because the court found that the plaintiff had properly invoked remedies under general maritime law, the court reversed the award of damages for mental anguish. *Id.* at 64. Although we do not interpret this case to hold that a state court entertaining a Jones Act or general maritime cause of action may only look to federal case law for guidance.[2]

To the extent that state law and federal law do not materially conflict or there is a vacuum in one or the other, both may be considered. However, it is clear from our interpretation of the law, that in questions of the sufficiency of the evidence in Jones Act cases, we must be guided by federal law. Appellant and appellee agree that substative federal law should apply, but not as to what the federal standard is. To determine the Jones Act standard of review, we must do so analogously via cases under the Federal Employers' Liability Act (FELA), 45 U.S.C. § 51 et seq., because the Jones Act specifically incorporates the rights and remedies available to railway workers under the FELA. It is firmly established that questions of sufficiency of evidence for the jury in cases arising under the FELA in state courts are to be determined by federal law, and a jury's verdict on liability issues in FELA cases, whether for the employer or employee, cannot be reviewed on appeal using local "weight and sufficiency standards." *Texas and Pacific Railway Co. v. Roberts*, 481 S.W.2d 798, 800-801 (Tex. 1972). The test was stated in the landmark case of *Rogers v. Missouri Pacific R. Co.*, 77 S.Ct. 443 (1957):

> Under this statute the test of a jury case is simply whether the proofs justify with reason the conclusion that employer negligence played any part, *even the slightest*, in producing the injury or death for which damages are sought. (emphasis added)

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[2] Indeed, the Texas Supreme Court has recently held that federal maritime law does not preempt the State's limitations on its consent to be sued. *State Dept. of Highways v. Dopyera*, 834 S.W.2d 50, 53 (Tex.), *cert. denied*, ____ U.S. ____, 113 S.Ct. 636 (1992).

This specific language was cited with approval and was applied to Jones Act cases in *Ferguson v. Moore-McCormick Lines, Inc.*, 77 S.Ct. 457, 458, (1957). And the U.S. Supreme Court has repeatedly held that the FELA and the Jones Act are co-equal statutes which are to be interpreted and applied in the same way. *Kernan v. American Dredging Co.*, 355 U.S. 426, (1958). We accordingly followed this line of reasoning as to causation in a Jones Act case in *Brown & Root, Inc. v. Wade*, 510 S.W.2d 408, 410 (Tex.App.–Houston [14th Dist.] 1974, writ ref'd n.r.e.); *see also Nobles v. Southern Pacific Transportation Co.*, 731 S.W.2d 697 (Tex.App.–Houston [14th Dist.] 1987, writ ref'd n.r.e.).

The plaintiff's negligence and causation burden in Jones Act cases has been characterized as very light, even "featherweight." *Smith v. Trans-World Drilling Co.*, 772 F.2d 157, 162 (5th Cir. 1985); *Rogers v. Eagle Offshore Drilling Services, Inc.*, 764 F.2d 300, 304-05 (5th Cir. 1985); *Landry v. Oceanic Contractors, Inc.*, 731 F.2d 299, 302 (5th Cir. 1984); *Chisholm v. Sabine Towing & Transportation, Co., Inc.*, 679 F2d 60, 62 (5th Cir. 1982) and Gilmore & Black, The Law of Admiralty, p. 377 (2d Ed. 1975).

Appellant, however asserts that the federal standard of review for causation involving a toxic chemical is that set out by the U.S. Supreme Court in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 113 S.Ct. 2786 (1993), and infers from that opinion a far stronger standard for Jones Act cases. *Daubert* involved a federal diversity suit originating in California. Plaintiffs, two minor children and their parents, sued, alleging serious birth defects had been caused by the mother's prenatal use of Benedectin, a drug designed to prevent morning sickness. The Supreme Court reversed a summary judgment which had been entered against the Dauberts, and ruled that (1) "general acceptance" is not a necessary precondition to admissibility of scientific evidence under Federal Rules of Evidence, and (2) Federal Rules assign to the trial judge the task of ensuring that expert testimony is reliable and relevant. *Id.* at 2794-96. It put to rest the notion that the so-called *Frye* rule superseded the Federal Rules of Evidence as to the admissibility of expert opinion evidence. *Id.* The *Frye Rule*, in existence for 70 years, holds that expert opinion evidence must have gained general acceptance in the field in which it belongs to be admissible. *Frye v. United States*, 293 Fed. 1013, 1014 (D.C. Cir. 1923).

In essence, *Daubert* says that the only real judicial justification for excluding expert testimony is for the federal trial courts to consider the relevance and reliability of expert opinion evidence in a liberal fashion as required by the Federal Rules of Evidence. *Id.*

We find nothing in the *Daubert* case which eliminates the "featherweight" burden of proof in a Jones Act case to establish negligence and causation. And we find that in the case before us, unlike *Daubert*, the queston of admissibility of the expert testimony is moot. Appellant levied no objections to the admissibility of the expert witnesses for appellee. Indeed, it did not object to their testimony at any time until after it was presented to the jury. Instead, appellant seizes on the scientific methodology language referred to in *Daubert* and concludes that the expert evidence here is not supported by proper scientific methodology and is therefore insufficient to support the damages verdict in this case. *Id.* at 2796. We do not believe that an injured seaman under the Jones Act precedents previously mentioned, is now required to produce a favorable epidemiological study, which is apparently the preferred scientific method for proof of toxic tort damage, in order to prove causation. *Brock v. Merrill* [sic] *Dow Pharmaceuticals, Inc.*, 874 F.2d 307 (5th Cir. 1989). We find other relevant distinctions between this case, *Daubert*, and other Benedictin cases, which we will discuss later after a general review of the expert evidence.

Appellants are even more expansive than the federal standards of *Daubert* in their position. They assert that the expert evidence in this case would be insufficient to sustain the verdict even under Texas negligence and causation standards. They refer us to a recent sister appellate court's opinion as supportive of their position. *Merrell Dow Pharmaceuticals Inc. v. Havner*, 1994 WL 48814 (Tex.App.—Corpus Christi 1994, no writ) (opinion not yet released for publication in the permanent law reports). In *Havner*, a panel of the appellate court reversed a judgment based on a jury verdict in a toxic tort negligence case, also involving Benedictin. It applied what it perceived to be the federal *Daubert* standard to Texas law. Indeed, it went beyond *Daubert*—even beyond appellant's position—and ruled that causation conclusions expressed in terms of reasonable medical probability by a qualified expert witness, amount to no evidence, not even a scintilla, as a matter of law. *Id.* Even appellants here concede by alleging only

insufficiency grounds "that there is conflicting evidence on the issue." *Raw Hide, supra. Havner's* conclusion totally ignores the expert's training, experience, knowledge, even treatment, test-tube analysis and chemical composition analysis. Needless to say, we disagree with that conclusion by a panel of our sister court. Our view of long standing Texas precedents reveals that experts qualified on the basis of their experience, training, treatment, and knowledge, who testify in terms of reasonable medical probability not only constitute some evidence of causation, but are frequently determinative of the issue. *Lenger v. Physician's Gen. Hospital,* 455 S.W.2d 703 (Tex. 1970).

If *Havner* becomes binding precedent in its present form, we presume that our instructions to the jury based on TEX. R. CIV. P. 226a will have to be eliminated or certainly modified. No longer could we with judicial integrity instruct jurors that they "are the sole judges of the credibility of the witnesses and the weight to be given to their testimony."

In any event, Texas law is generally consistent with federal law regarding expert testimony on causation. To recover damages, a plaintiff must prove by competent evidence a causal nexus between the event sued upon and the injuries alleged. *See Morgan v. Compugraphic Corp.*, 675 S.W.2d 729, 732 (Tex. 1984). "Causal connection . . . must rest in reasonable probabilities; otherwise, the inference that such actually did occur can be no more than speculation and conjecture." *Insurance Co. of North America v. Myers,* 411 S.W.2d 710, 713 (Tex. 1966); *see also Gideon v. Johns-Manville Sales Corp.*, 761 F.2d 1129, 1137 (5th Cir. 1985). Whether the evidence rests in reasonable probabilities depends upon the substance of the expert's testimony. *Myers,* 411 S.W.2d at 713. "Expert testimony that the event is a possible cause of the condition cannot ordinarily be treated as evidence of reasonable medical probability except when, in the absence of other reasonable causal explanation, it becomes more likely than not that the condition did result from the event." *Lenger,* 455 S.W.2d at 707. Here, all of appellee's expert witnesses testified that appellee's severe and lengthy exposure to Diazinon caused his prolonged neural damage. They expressed their opinion on bases, ranging from reasonable medical probability to without a doubt.

As supportive of its methodology postion, appellant directs us to three fifth circuit cases. *Brock v. Merrill* [sic] *Dow Pharmaceuticals,*

Inc. 874 F.2d 307 (5th Cir. 1989) (Brock I); *Brock v. Merrill* [sic] *Dow Pharmaceuticals, Inc.*, 884 F.2d 166 (5th Cir. 1989) (Brock II); *Christophersen v. Allied Signal Corp.*, 914 F.2d 66 (5th Cir.), *reh. en banc*, 939 F.2d 1106 (5th Cir. 1991), *cert. denied*, 112 S.Ct. 1280 (1992). The Fifth Circuit held that courts should "critically evaluate the reasoning process by which the experts connect data to their conclusions in order for courts to consistently and rationally resolve the disputes before them." *Brock I*, 874 F.2d at 310. In *Brock*, the Fifth Circuit analyzed the types of evidence regarding causation typically offered in a toxic tort case. The court noted that the most useful and conclusive type of evidence is the epidemiological study which attempts "to define a relationship between a disease and a factor suspected of causing it. . . ." *Id.* at 311. Regarding such general population studies, the court added:

> To define that relationship [between a disease and its alleged cause], the epidemiologist examines the general population, comparing the incidence of the disease among those people exposed to the factor in question to those not exposed. The epidemiologist then uses statistical methods and reasoning to allow her to draw a biological inference between the factor being studied and the disease's etiology.

Id. As the court also mentioned, epidemiological studies do not necessarily exclude other possible causes for the same disease. *Id.* Two epidemiological studies of the effects of the drug Benedictin were admitted into evidence in *Brock*. *See id.* at 312. One study did not support a statistically significant connection between Benedictin and birth defects. *Id.* The other study found a greater risk of birth defects, but that the risk was also not statistically significant. *Id.* Because the plaintiffs did not present any statistically significant epidemiological proof that the drug causes birth defects, the court held that the evidence was insufficient to enable a trier of fact to make a reasonable inference as to causation.[3] *See id.* at 315; *Brock II*, 884 F.2d at 167.

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[3] In *Brock I*, the Fifth Circuit found "the lack of conclusive epidemiological proof to be fatal to the Brock's case." 874 F.2d at 313.

In a later case, the Fifth Circuit again addressed questions about an expert's testimony regarding causation in a toxic tort case. *See Christophersen, supra.* In *Christophersen,* the trial court had excluded an expert's opinion that exposure to certain chemicals at a plant caused cancer. *Id.* at 1109. In determining whether the trial court erred in excluding this testimony, the Fifth Circuit set forth three threshold requirements for the admissibility of expert testimony: (1) whether the witness is qualified to express an expert opinion on the topic at issue, (2) whether the data upon which the expert relies are of the same type other experts in the field reasonably rely upon in forming their opinions, and (3) whether in reaching his conclusion, the expert used a "well-founded methodology or mode of reasoning, one 'sufficiently established to have gained general acceptance in the particular field in which it belongs'." *Id.* at 1110-11. Even if the testimony meets these three requirements, it may still be excluded if the testimony's "potential for unfair prejudice substantially outweighs its probative value." *Id.* at 1110; *see also* FED. R. EVID. 403.

The trial court in *Christophersen* had criticized the expert's testimony on the grounds that the facts and data underlying the opinion were inaccurate and incomplete and that the expert offered no scientific methodology to support his conclusion. *Id.* at 1113-15. In reviewing these criticisms, the Fifth Circuit first found that the expert over-estimated the duration of the decedent's exposure to certain chemicals

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On rehearing, the court changed this sentence and others indicating a requirement of conclusive epidemiological studies to a requirement of "statistically significant epidemiological proof." *Brock II,* 884 F.2d at 167. But the realistic conclusion in the opinion puts great weight on epidemiological studies as the premiere type of proof to establish causation in toxic tort cases. For an opposing and somewhat critical view of *Brock,* as well as an excellent review of scientific methodologies including epidemiological studies and their weaknesses, *see DeLuca v. Merrell Dow Pharmaceuticals, Inc.* 911 F.2d 941, 946-52 (3rd Cir. 1990). Also see K.J. Rothman, "Modern Epidemiology" (1986), which places less weight on significance testing such as epidemiological studies.

and had no accurate data regarding the chemical composition of the fumes in the plant where the alleged exposure occurred. *Id.* at 1113. Thus, the court agreed that the trial court could properly reject expert opinions founded on critical facts that are untrustworthy. *Id.* at 1114. The expert in question also testified that the kind of evidence most often used to establish causation are epidemiological studies, animal testing, and *in vitro* testing. *Id.* at 1115. Despite his testimony regarding the main methodologies, this expert offered no methodology to support his conclusion that the types of chemicals used at the plant were associated with the form of cancer found in the decedent. *Id.* Because the expert offered no well-founded methodolgy to support his opinion regarding causation, the Fifth Circuit concluded that the expert's opinion was no more than a scientific hunch and was inadequate to support a judgment in favor of the plaintiff. *Id.*

Brock and *Christophersen* both emphasize the importance of epidemiological studies to establish causation in federal toxic tort cases. *See Brock I*, 874 F.2d at 313; *Christophersen*, 939 F.2d at 1115. Furthermore, both cases take the position that expert opinions unsupported by some type of well-founded scientific reasoning or methodology constitute mere speculation, insufficient to support a judgment. *See Brock I*, 874 F.2d at 315; *Christophersen*, 939 F.2d at 1115. *Daubert* has now closed the field and given federal trial courts some "gatekeeping" responsibilities in determining the admissibility of expert testimony. In dicta it gives support to some type of scientific methodology approach to evaluate the reliability of scientifc evidence. *Daubert*, 113 S.Ct. at 2797.

Appellant contends the conclusions of appellee's experts amounted to speculaton because they were unsupported by scientific epidemiological studies or other unnamed, unproved well-founded methodologies establishing a link between Diazinon exposure and delayed permanent neurotoxic damage; that *Daubert* now requires a well-founded scientific methodology in order to establish causation in all tort cases involving poisonous chemicals. Texas courts, however, with the exception of the *Havner* case by the Corpus Christi court, have not adopted this approach.

Turning to the evidence in this case, we find that appellee offered the testimony of several expert witnesses, four of whom were medical doctors who examined and treated him. One non-treating expert was

Dr. Edward Ezrailson, who was qualified without objection as an expert witness. Dr. Ezrailson has a Ph.D. in biochemistry, had studied the subject of toxicology, how poison affects the health of human beings. He had done advanced studies in pharmacology, completed his first postdoctoral fellowship at Baylor College of Medicine in its Pharmacology Department. Later, he completed a second postdoctoral study at Baylor in the subjects of molecular pharmacology and cellobiose physics; the latter, involving the study of how nerve cells communicate and electrical impulses are sent from cell to cell. He joined the faculty at Baylor, was awarded and completed a study grant for the Environmental Protection Agency on the toxic effect of organophosphates on lab animals.

He testified that he was familiar with the chemical makeup and toxicology of Diazinon and that it had known poisonous properties. He discussed his extensive review of the available scientific literature on the subject of organophosphates.[4] He testified in detail about how organophosphates like Diazinon attack the nervous system and can be deadly. He testified in great detail about how human overexposure to organophosphates results in neurotoxic damage. He explained how the inhalation of an organophosphate causes the inactivation of acetylcholinesterase, an enzyme necessary for the transmission of nerve signals from one nerve pathway to another. He explained that such inhalation can temporarily destroy the enzyme, and thereby cause a continuous disruptive nerve signal. This causes such symptoms as muscle cramps and chest pains, among others. He also stated that such inhalation can also cause the enzyme to become neurotoxic with the ultimate result that it kills nerve cells, and that it can have a delayed neurotoxic effect that can go for years and years, and as in this case, even a lifetime.

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[4] Dr. Ezrailson's testimony referenced the following articles: (1) "Sequelae of Acute Organophosphate Poisoning" by Dr. I.R. Tabershaw, which concluded that exposure to certain organophosphates can result in delayed symptoms (did not list diazinon as one of the organophosphates studied); (2) "Delayed Neurotoxicity and Other Consequences of Organophosphates Esterase," by Ronald Baron, not admitted into evidence, noting that certain organophosphates have

More specifically, Dr. Ezrailson reviewed the ship logs, medical records, and deposition testimony in this case concerning appellee's Diazinon exposure. He also reviewed the Material Safety Data Sheet required by federal law from the manufacturers of Diazinon to alert users to the dangers of Diazinon exposure; from these he concluded that Richard Ellis had suffered an exposure to Diazinon in an enclosed space that was 100 to 200 times that considered safe for humans. He reviewed the symptoms which the Material Safety Data Sheet listed for overexposure to Diazinon; these were headaches, blurred vision, nervousness, weakness, nausea, cramps, respiratory difficulty, muscle twitches, convulsions, and loss of reflexes. Most of these symptoms and others were initially or later exhibited by Ellis. He also reviewed the laboratory findings after the exposure which reflected below normal levels of cholinesterase in appellee's blood cells and blood plasma. These were further confirmation of his diagnosis of a severe exposure.

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been shown to cause a delayed neurotoxic effect, but that this neuropathy is always proceeded by a period of approximately 7-14 days (article did not mention diazinon); (3) "Correlations Between Recovery Rate of Neurotoxic Esterases and Sensitivity of the Organic and Phosphate Induced Delayed Neurotoxicity," by Carrington, not admitted into evidence but does not even mention diazinon; (4) "Long Term Effects of the Organophosphate Sarin on EEG in Monkeys and Humans," by Duffey and Burchfiel, not admitted into evidence, stating that many, but not all organophosphates have been found to cause delayed neurotoxicity; (5) two articles by Finklestein entitled, "Brain Acetylcholinesterase After Acute Parathion Poisoning," and "CNS Involvement in Acute Organophosphate Poisoning: Specific Pattern of Toxicity, Clinial Correlates, and Antidotal Treatment," both of which concerned parathion and neither were admitted into evidence but does not consider or discuss diazinon; (6) "Anxiety Associated with Exposure to Organophosphate Compounds," by Levin, not admitted into evidence, which concerned effects on farm workers who received chronic exposure to organophosphates and found no relationship between exposure and depression; (7) "Behavioral Effects of Organophosphate Pesticides in Men" by Levin and Midski, not admitted into evidence; (8) "Spatial Memory Impairment and Central

Based on his education, training, experience, extensive review of scientific literature, and the detailed analysis of the medical records and facts of this case, Dr. Ezrailson concluded that in reasonable probability Richard Ellis had suffered permanent injury to his nervous system caused by his severe and prolonged exposure to Diazinon.

Another expert witness for appellee was Dr. Alfred R. Johnson, a Doctor of Osteopathy, who works at the Environmental Health Center of Dallas, Inc. This center provides health care to the public, emphasizing the health effect and treatment of environmental exposure. Dr. Johnson testified that he has treated appellee and other patients suffering from exposure to Diazinon or other similar chemicals. Dr. Johnson's diagnosis for Richard Ellis was "organophosphate toxic exposure with relating damage in the form of delayed toxicity reaction and permanent nerve damage." Dr. Johnson testified that exposure to Diazinon can cause delayed central nervous system symptoms, and

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Muscarinic Receptor Loss Following Prolonged Treatment with Organophosphate" by McDonald, not admitted into evidence, which studied the effects following daily exposure to two insecticides, not including diazinon, over a fourteen-day period; (9) "Delayed Neurotoxic Effects of some Organophosphorous Compounds," by Johnson, not admitted into evidence, delayed neurotoxicity manifests itself 7-14 days after exposure but not all organophosphates induce delayed neurotoxicity; (10) "Evidence of Necrosis in Human Intercostal Muscles," by Wecker, Mrak, and Dettbarn, not admitted to evidence, which concerned a study of a man who received a fatal dose of malathion and diazinon but did not link diazinon to delayed neurotoxicity; (11) "Fatal Diazinon Poisoning in Man," by Hendricks, not admitted into evidence, which concerned a person who committed suicide by ingesting diazinon but did not link diazinon with delayed neurotoxicity; (12) "Central Actions of Organophosphate Agents," by Karczmar, not admitted into evidence, which studied the mental effects of exposure to certain organophosphates, not including diazinon; (13) "Organophosphate Polyneuropathy," by Lotty, not admitted into evidence, that concluded symptoms of organophosphate induced delayed neurotoxicity usually begin one to three weeks after acute exposure and lists six chemicals that cause delayed neurotoxicity but does not list diazinon as one of those included in the study.

that the length of time before such symptoms appear, can vary with the individual from a couple of weeks to a few months. Dr. Johnson testified that, in his opinion, based upon reasonable medical probability, appellee's current problems were caused by the August 1982 exposure to Diazinon. Dr. Johnson based this diagnosis on his examination of appellee and on a review of appellee's medical records showing a prolonged exposure to Diazinon and depressed levels of cholinesterase. Dr. Johnson testified that he was familiar with the literature regarding organophosphate poisoning, but he could not recall any studies dealing only with Diazinon and the long-term effects of Diazinon exposure on humans.

Appellee also called Dr. Francis J. Waickman as an expert witness. Dr. Waickman is board certified in clinical immunology, allergy, environmental medicine, utilization review and quality assurance, and pediatrics. This latter, his speciality, which initially prompted him to seek further expertise in the other fields [sic]. He also has taken post-graduate courses in many areas, including toxicology, allergy, and clinical immunology, He also evaluates and treats people who have chemical sensitivities and who have been poisoned by exposure to organophosphate pesticides. He testified that from his examination of Richard Ellis, he found central nervous system problems, including loss of memory, slow verbal responses, and diminished reasoning and recall, less than expected from a man of Ellis' age and education. Waickman also listed symptoms of muscle weakness and emotional instability. Dr. Waickman discussed extensively the long term effects of delayed neurotoxicity which can be caused by organophosphates like Diazinon. He described how such substances can cause permanent injury to the axon of the nerve, which can ultimately cause the nerve cell body to die.

Dr. Waickman testified specifically about causation. He stated that there is "no question" that Richard Ellis' central nervous system problems that he observed were caused by his exposure to Diazinon. He also said there is "no doubt" about the causal connection between the Diazinon exposure and his problems. Further, he discussed Ellis' case with the top consultant in the Environmental Protection Agency, who agreed that Ellis' health problems were "unquestionably" caused by the Diazinon poisoning. He also stated Richard Ellis' central nervous system damage was permanent.

Finally, appellee offered the testimony of Dr. Richard Austin, a clinical psychologist who has had experience treating people who have been poisoned by various chemicals. Dr. Austin personally examined and evaluated appellee, gave him a battery of psychological tests, reviewed the medical records of doctors who had treated appellee, elicited historical information from appellee's family and friends, and reviewed scientific literature regarding organophosphate poisoning. Dr. Austin concluded that appellee suffered nervous system damage resulting in emotional problems caused by the Diazinon poisoning in 1982. Dr. Austin was familiar with a study, admitted into evidence, that was performed on behalf of the EPA by Drs. Savage, Keefe, and others, entitled "Chronic Neurological Sequelae of Acute Organophosphate Pesticide Poisoning."[5] This study involved testing of individuals chronically exposed to a variety of organophosphate pesticides, not including Diazinon. Dr. Austin agreed that appellee suffers from many of the same impairments and exhibits similar test results to those discussed in the literature resulting from organophosphate poisoning. Dr. Austin testified that there are authoritative studies showing that organophosphate poisoning can cause delayed neurotoxic effects.

Appellee also presented testimony from Dr. James Carter, his family doctor from his hometown. Dr. Carter testified that he saw and treated Ellis at his clinic in 1982 after the Diazinon exposure. His symptoms were dizziness, blurred vision, headaches, numbness in his arms and legs and chest pain. In the next two years, appellee

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[5] The two studies admitted into evidence include: (1) "Chronic Neurological Sequelae of Acute Organophosphate Pesticide Poisoning," by Savage, Keefe, Mounce, Heaton, Lewis and Burcar, offered into evidence by appellee which evaluated the latent neurological effects of organophosphate poisoning on 100 patients, none of which had been exposed to diazinon; and (2) "Pesticides & brain-function changes in a controlled environment" by Rea, Butler, Laseter, and DeLeon, offered into evidence by appellant, which studied whether environmentally controlled conditions improve the symptoms of patients who have been exposed to other organophosphate pesticides, other than diazinon.

was also treated for stomach cramps, blurred vision, muscle cramps, weakness, fatigue and anxiety. In 1986, he was having episodes of passing out and blackout spells. Dr. Carter also testified that Ellis, prior to the exposure, was in good health and had no psychological or mental problems until after the exposure to Diazinon.

Appellant presented the testimony of three doctors, Dr. Velma Campbell, Dr. Eric Comstock, and Dr. Francisco Perez. Dr. Campbell treated appellee in the emergency room at the New Orleans General Hospital. Campbell testified that some pesticides can cause delayed neurological symptoms, but that to her knowledge, Diazinon is not one of these.

Dr. Perez is a clinical psychologist specializing in neuropsychology and behavioral medicine. Perez did not examine appellant, but reviewed his medical and psychological records and reviewed the literature regarding organophosphates. Perez testified that in his opinion a worsening of a patient's psychological condition is not a typical symptom caused by exposure to Diazinon. Perez concluded, based on his review of the records and literature, that appellant's symptoms are most likely unrelated to the Diazinon exposure.

Dr. Eric Comstock, a medical toxicologist, although now primarily a forensic consulting expert, testified that he had experience in the past treating persons exposed to toxic substances, 80-100 of which involved Diazinon. Comstock also reviewed appellant's medical records and the literature about organophosphates, but never examined appellant. Comstock agreed that appellant initially exhibited mild acute effects from the exposure, including eye irritation, slight weakness, diarrhea, headaches, and vomiting, but based on his experience and review of the records and literature, Comstock stated that in his opinion appellant has suffered no delayed effects related to the Diazinon exposure.

Comstock testified, without specific evidentiary proof, that Diazinon is an "unrestricted use" pesticide, which means that it does not cause, or has not been shown to cause, severe, impairing long-term effects. This was contrary to evidence from Dr. Ezrailson that Diazinon was not unrestricted and was specifically precluded from use on golf courses. Comstock noted that his personal experience treating persons exposed to Diazinon has not indicated that Diazinon causes delayed neurotoxicity. Furthermore, Comstock opined that

Diazinon has been widely used by the public for many years and that, if it caused delayed neurotoxicity, this would have been identified. Finally, Comstock testified that none of the literature supports the conclusion that Diazinon causes delayed neurotoxicity, and that there is literature concluding Diazinon does not cause delayed neurotoxicity.[6] However, this was not introduced into evidence and no basis for the unknown authority's conclusion as related by Comstock was given. The record reflects that Dr. Comstock's credibility was challenged by vigorous cross examination which referred to criticism of his testimony by the judge in a previous toxic tort court case.

After reviewing all of the expert testimony and other evidence concerning the circumstances of the appellee's exposure to an admittedly dangerous chemical and the state of his health before, and after, the exposure, we find that the evidence more than satisfies the Jones Act standard for negligence and causation. Or stated more precisely, we find that there was sufficient evidence before the jury to justify their finding that the employer's admitted negligence in exposing appellee to extreme levels of a dangerous chemical pesticide did play a part in producing the injury for which the damages were sought and awarded. *Rogers v. Missouri Pacific R. Co., supra.* In addition to finding that the evidence satisfies this so-called "featherweight" burden of negligence and causation in Jones Act cases set out in the previously cited cases, we also find that the evidence was sufficient under the greater standard of proof for causation under Texas evidentiary rules.

Juries are entitled to determine causation based on qualified expert testimony based on reasonable medical probability. Indeed, they can rely on expert testimony that the event is a "possible cause" of the injury or condition when, in the absence of other reasonable causal explanation, it becomes "more likely than not" that the condition did result from the event. *Lenger,* 455 S.W.2d at 707. Here, the expert evidence was clearly based on reasonable medical probability and

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[6] Comstock specifically noted that the article entitled "Posoning Due to Organophosphate Insecticides," (author unknown) concluded that Diazinon, as well as certain other insecticides, did not produce neuropathy.

stronger in some instances. But even more telling, was the circumstantial evidence presented which would fulfill *Lenger's* "possible" cause standard, because there was an absence of other reasonable causal explanation of the change in this seaman's good health before his exposure to Diazinon to his subsequent, continuing symptoms which were traced, specifically and analogously, to organophosphate poisoning. This "possible cause" standard of *Lenger* when applied to the facts of this case is not too far removed from the "featherweight" standard of the Jones Act previously enumerated.

We also disagree with appellant's implied suggestion that we should apply a scientific, rather than a legal standard of evidence as to causation in a Jones Act, or a Texas negligence case. In essence, they [sic] are suggesting that we should apply a version of "beyond a reasonable doubt" rather than a Jones Act, or preponderance of the evidence standard. *See Benoit v. Wilson,* 150 Tex. 273, 239 S.W.2d 792, 797 (1951). We acknowledge the "scientific methodology" federal approach mentioned as dicta under the "general observations" section of *Daubert,* and relied on by appellants. *Daubert,* 113 S.Ct. at 2796-98. Whatever final form and application may be given this approach by the federal courts, we find nothing to indicate that it even in its initial, undefined form, is intended to completely erase the liberal standard of evidence for negligence and causation in cases involving injuries to seamen under the Jones Act.

Should we adopt such a strict scientific methodology standard in toxic tort cases, there would be no real need for juries, or judges for that matter, to determine the weight and credibility of expert evidence. A computer properly programmed with the current preferred scientific methodology would be sufficient. The expert evidence and facts of the case could be entered, and the computer, with the speed of electrical impulses, could compare the evidence to its methodology litmus and respond: "accepted or rejected, according to presently preferred methodology." The speed and efficiency of applying such a standard is obvious. It eliminates that unpredictable element, the human juror, with all of his or her attendant weakesses, such as common sense and human experience. A strict scientific standard is attractive to us judges because it has an aura of perceived certainty around it. And we all desire certainty. There is, however, no certainty in science, nor in law, but the legal standard for expert evidence has

generally served us well notwithstanding its imperfections. We are constantly fine tuning it, but without removing it from its foundation. It is designed to aid the jury, not replace it. Nor should it be removed from its moorings, the human elements: the advocates to present it, the judges to regulate it, and the jurors to be guided by it, in order to decide the issue.

Aside from the scientific evidentiary issues, we also note the significant factual distinctions between this case and the *Brock* and *Daubert* cases. The chemical here, unlike Benedictin, was not designed to be orally ingested by humans, nor for that matter, by any other living creatures, except insects. Diazinon is an organophosphate specifically formulated to kill insects by destroying their nervous systems. It is known to be toxic to the nervous systems of humans if ingested, inhaled or improperly touched. Also, in contrast to the Benedictin cases, the extent of the overexposure to the toxic chemical by appellee is clear-cut. The symptoms he experienced were immediate and continuing, according to the evidence. They were the type of symptoms known to be caused by overexposure to Diazinon. Only their duration and permanency were contested. In the Benedictin cases, the alleged exposure was to an unborn fetus in the early stages of its development. The comparative difficulty in determing even the extent of the chemical's exposure to the embryonic fetus, via the mother's ingestion of a pill, is obvious. Even more difficult if not impossible, is the retroactive determination of the condition of the fetus before and after the exposure. Added to this is the effect of other unknown factors on the fetus. By way of further evidentiary contrast, here, the health of appellee before the severe exposure was normal. The exposure was direct, not indirect, and the extent of the exposure was specifically shown to be 100 to 200 times that considered to be safe for humans. Indeed, even after several days and three cleanups, a biochemist brought on board by appellant found the chemical still present in amounts that were in one instance, 14 times, and in another, 36 times, stronger than the maximum safe amounts recommended by the manufacturer. Appellee's health after the exposure was also known. Evidence showed that he had initial and continuing symptoms that included eye problems, memory loss, blackouts, chest pains, severe headaches, loss of muscular control, nausea, fatigue, and numbness in arms and legs. He also experienced severe psychological

and other mental problems, along with thoughts of suicide. We find these evidentiary distinctions significant and the expert witnesses were entitled to consider them along with their other knowledge and expertise in making their conclusion that a *causal nexus* exists between the exposure to Diazinon and appellee's injury. And, in turn, the jury was entitled to weigh and evaluate them along with all the expert evidence. Therefore, contrary to appellant's contentions, we do not find the *Brock* and *Daubert* cases to be comparable adverse precedents determinative of this case.

If we accept appellant's interpretation, *Daubert* would, by dicta, impliedly overrule a long line of federal precedents, including *Sentilles v. Inter-Caribbean Shipping Corp.*, 361 U.S. 107 (1959). *Sentilles* was a Jones Act case in which the seaman alleged that his previously latent tubercular condition was aggravated and activated by a fall he sustained on board the ship. The best expert medical evidence was that the activation of the latent tuberculosis might be a consequence of the accident, or it "probably aggravated his condition," although the expert would not say definitely. "We don't ever select one item and say that is the cause of any particular aggravation." *Id.* at 175. The U.S. Supreme Court reversed, holding that the evidence sustained the jury's conclusion that the accident caused the aggravation of the seaman's latent tuberculosis. It stated that:

> "The jury's power to draw the inference that the aggravation of petitioner's tubercular condition, evident so shortly after the accident, was not impaired by the failure of any medical witness to testify that it was in fact the cause . . . The members of the jury, not the medical witnesses, were sworn to make a legal determination of the question of causation. They were entitled to take *all the circumstances*, including the medical testimony into consideration." *Id.* at 175. (*emphasis added*).

No comparative battle of scientific methodologies was required in *Sentilles* and other Jones Act cases. Nor do we find it be to required here. The jury in our case was instructed in accordance with TEX. R. CIV. P. 226a that they were the sole judges of the credibility of the witnesses and the weight to be given to their testimony. They were presented with qualified expert witnesses who were not challenged

by the appellants as to the admissibility or credibility of their methodology. After considering the conflicting testimony of all the experts, and other evidence, they judged it's *[sic] credibility and weight*. Based on their evaluations, they answered "yes" to question no. 1 which inquired as to whether appellant's negligence played even the slightest part in producing injury or illness to Richard Ellis. We cannot now, as appellant's position would suggest, sit as a thirteenth super-juror and reach outside the evidence to apply some scientific methodology standard to re-weigh the evidence and its credibility over what the jury has already found. We simply do not have that power as an appellate court. *Benoit, supra*, at 796. Instead, we conclude, after reviewing the evidence through the lens of the Jones Act standard, that the jury was entitled to weigh the conflicting expert testimony based on reasonable probability along with the circumstantial evidence, and find that the extreme exposure to a toxic chemical, Diazinon, caused appellee's injury. We overrule appellant's first point of error and find that the evidence was sufficient.

In points of error two, three and four, appellant challenge [sic] the punitive damages of $1,000,000 awarded to appellee by the jury as a result of their gross negligence finding against appellant in response to question no. 7. Specifically, in point of error four, appellants [sic] assert that punitive damages cannot be recovered under either the Jones Act or general maritime law. At the time this cause was argued, it was clear that exemplary damages were not available under the Jones Act. *Bergen v. F/V St. Patrick*, 816 F.2d 1345, 1347 (9th Cir. 1987); *see Kopczyknski v. The Jacqueline*, 742 F.2d 555, 560-61 (9th Cir. 1984), *cert. denied*, 471 U.S. 1136, (1985). However, the recoverability of such damages under general maritime law was allowed in *Complaint of Merry Shipping Inc.*, 650 F.2d 622 (5th Cir. 1981). Following the submission of this cause, the Texas Supreme Court has vindicated appellant's position in *Penrod Drilling Corp. v. Williams*, 868 S.W.2d 294 (Tex. 1993). *Penrod* held that punitive damages were "non-pecuniary" and therefore not recoverable by Jones Act seaman in general maritime unseaworthiness claims. It grounded its ruling on the rationale expressed by the U.S. Supreme Court in *Miles v. Apex Marine Corp.*, 498 U.S. 19 (1990); *Penrod*, 868 S.W.2d at 296-297. We therefore sustain appellant's point of error four and reverse the judgment for punitive damages awarded to appellee for

gross negligence. Points of error two and three are necessarily mooted by this ruling.

In points of error five and six, appellants contend the trial court erred in excluding certain evidence of appellee's alleged alcohol abuse. Appellant cites to several references in the record where the trial court allegedly sustained appellee's objection to the testimony or records of Drs. Perez, Carter, and Austin regarding appellee's alleged use of alcohol.

The record shows that the trial court had sustained appellee's motion in limine regarding evidence of appellee's alleged use of alcohol. When appellant questioned appellee's witness, Dr. James Carter, about appellee's use of alcohol, the testimony occurred outside the presence of the jury. The record shows no offer to admit this evidence by appellant and no ruling by the trial court. By failing to offer this testimony and obtain a ruling regarding its admission, appellant cannot complain about the exclusion of this evidence on appeal. *Lakeway Land Co. v. Kizer,* 796 S.W.2d 820, 827 (Tex.App.–Austin 1990, writ denied).

Before appellant offered the testimony of Dr. Francisco Perez, the trial court stated that it would allow testimony regarding appellee's use of alcohol only insofar as it could be a contributing cause of appellee's symptoms. The trial court refused to allow testimony regarding alleged alcohol use or any prior DWI arrest, based on its prejudicial effect. Dr. Perez, was, however, allowed to testify that he noticed handwritten references to alcohol use in Dr. Richard Austin's notes, and in his opinion, Dr. Austin should have explored this as a possible cause of appellee's symptoms. Dr. Perez noted that assesment of potential alcohol abuse is essential from a psychological standpoint, where there is a question of organic impairment, because excessive prolonged alcohol abuse can produce organic changes.

We find no error in the trial court's exclusion of testimony regarding a past DWI arrest on the ground that the probative value of this testimony was outweighed by its prejudicial effect. *See* TEX. R. CIV. EVID 403. The trial court did allow some testimony about appellee's use of alcohol and the possible relationship between excessive alcohol use and symptoms such as those alleged by appellee. Appellant has not established that any error on the part of the trial court in excluding testimony by Dr. Perez regarding alcohol use was

"calculated to cause and did cause rendition of an improper judgment." TEX. R. APP. P. 81(b)(1).

Appellant also contends the trial court erred in excluding Defendant's exhibit 1A, which contained the handwritten notes previously mentioned concerning alcohol use from the files of Dr. Austin. These were some third party's notes, not Dr. Austin's. During cross-examination of Dr. Austin, appellant attempted to offer the entire file of Dr. Austin including these notes. There was a discussion out of the presence of the jury regarding this exhibit, but the discussion is not contained in the record. In connection with this exhibit, appellant filed a motion in this court attaching an affidavit of the court reporter in the trial of this case and asked to supplement the record with a "new" page 1229 included in the statement of facts. The affidavit states that, at the request of appellant's counsel, the court reporter reviewed her notes and prepared a corrected version of page 1229 reflecting appellant's offer of exhibit 1A, appellee's objection, and the trial court's ruling, sustaining the objection. Appellant later filed a reply brief referencing this affidavit. Appellee has filed a motion to strike this affidavit and the reply brief. We took this motion with the case.

Appellee subsequently filed a supplemental motion to strike this affidavit and attached a new affidavit by the same court reporter and a copy of her notes taken during trial. In the new affidavit, the court reporter states that the original affidavit submitted by appellant, was in error to the extent it asserts that the record reflects an offer of exhibit 1A, an objection, and ruling by the trial court. The reporter now states that a review of her handwritten notes, stenographic notes, the audio records of the trial, and her memory indicate that exhibit 1A was not offered into evidence and there was no subsequent objection and ruling by the trial court. The reporter confirms that the amended page 1229 included in the statement of facts is accurate in that it reflects no offer of the exhibit or ruling by the trial court. Attached to this new affidavit is a copy of the reporter's handwritten notes indicating no offer or ruling on exhibit 1A. Based on our review of the record and the subsequent affidavits and supporting notes, we grant appellee's motion to strike the initial affidavit.

Thus, the record, including the amended page from the statement of facts, indicates that after the discussion off the record, appellee's attorney voiced his willingness to stipulate that everything, except

exhibit 1A, were business records of Dr. Austin. Exhibit 1A contained the handwritten third-party notes. Appellee apparently agreed to the admission of exhibit one without these handwritten notes; however, appellant obtained no ruling on the admission of these exhibits and made no bill of exceptions. Because appellant failed to obtain a ruling regarding this evidence, appellant has not preserved this complaint for appellate review. *Industrial Disposal Supply Co., Inc. v. Perryman Bros. Trash Serv., Inc.* 664 S.W.2d 756, 762 (Tex.App.—San Antonio 1983, writ ref'd n.r.e). We overrule points of error five and six.

In points of error seven through ten, appellant challenges the submission of jury questions regarding maintenance and cure and the award of exemplary damages on the issue of maintenance and cure. Appellant claims no evidence supported the submission of issues on maintenance and cure and no evidence supported the finding requisite to imposition of exemplary damages that appellant's failure to pay maintenance and cure was willful, arbitrary, and capricious.

Upon injury, a seaman is entitled to maintenance and cure until the date of maximum possible cure, or the date beyond which further treatment would not improve the condition. *Johnson v. Marlin Drilling Co.*, 893 F.2d 77, 79 (5th Cir. 1990). Punitive damages are available if there is proof the shipowner's failure to pay maintenance and cure was willful, arbitrary, and capricious. *Breese v. AWI, Inc.*, 823 F.2d 100, 103 (5th Cir. 1987).

In jury question no. 10, the jury found that appellee never reached maximum medical cure. Under jury question no. 12, the jury found that appellant acted willfully, arbitrarily, and capriciously in failing to pay maintenance and cure to appellee. Based on this affirmative finding, the jury awarded appellee $1 million in exemplary damages in jury question no. 13. Appellant argues that there was no evidence appellee demanded maintenance and cure, that appellant ever refused to pay maintenance and cure, or that appellant acted arbitrarily and capriciously in failing to pay these amounts. In *Harrell v. Dixon Bay Transp. Co.*, 718 F.2d 123, 129-30 (5th Cir. 1983), the court upheld a lower court's finding of legally insufficient evidence of an arbitrary and capricious refusal to pay maintenance and cure where the shipowner relied on the advice and opinions of treating physicians in stopping payments, and where the seaman did not inform the shipowner of further treatments and a newly discovered condition.

In *Neveaux v. Lykes Bros. Steamship Co., Inc.*, 476 F.2d 177, 178-79 (5th Cir. 1973), the court found no arbitrary or capricious refusal to pay maintenance and cure where the shipowner delayed payment to investigate a claim from a seaman that included no elaborative details.

Appellee contends that, under *Gaspard v. Taylor Diving & Salvage Co., Inc.*, 649 F.2d 372 (5th Cir. 1981), there need not be evidence a seaman demanded payment or presented medical bills to the shipowner to support a finding of arbitrary and capricious refusal to pay maintenance and cure.[7] We find *Gaspard* distinguishable. In *Gaspard*, the seaman had not demanded payments and had presented no medical bills to the shipowner after the seaman left the shipowner's employ. *Id.* at 374. Based on these facts, the trial court found no willful, arbitrary, or capricious failure to pay maintenance and cure. *Id.* The Fifth Circuit first noted:

> The duty to provide maintenance and cure embraces not only to obligations to provide a subsistence allowance and to pay for medical expenses actually incurred by the seaman, but to take all reasonable steps to ensure that the seaman, when he is injured or becomes ill, receives proper care and treatment.

Id. at 375. In reviewing the evidence, the Fifth Circuit found that before the seaman terminated his employment he had suffered symptoms of decompression sickness on a number of occasions, had

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[7] Appellee also cites *Tullos v. Resource Drilling, Inc.*, 750 F.2d 380 (5th Cir. 1985) as supporting his contention that there need not be evidence the seaman notified the shipowner of his claim for maintenance and cure. In *Tullos*, however, the seaman did advise the shipowner of his medical claim, but the diagnoses of the doctors conflicted and the shipowner discontinued payments. *Id.* at 387-88. The court found that the diagnoses of the physicians were not so clear and consistent as to validate removal of a jury issue on arbitrary and capricious denial of maintenance and cure. *Id.* at 388. *Tullos* does not hold that a seaman need not notify the shipowner of his claims.

reported these symptoms to the shipowner, and the shipowner unreasonably denied the seaman treatment in a decompression tank. *Id.* at 376. Thus, the court found that the shipowner did not take reasonable steps to ensure the seaman received proper care and treatment and this failure supported the jury finding. *Id.*

In this case, the evidence does not support the conclusion that appellant arbitrarily and capriciously refused proper treatment to appellee. Such an intentional type of refusal requires as a minimum either a notice or demand communicated to the employer, or specific facts which justify the inference that the employer knew and simply ignored or refused to pay. We find no evidence in this record that appellee notified appellant in any way of claims for payment after he left the ship, or that appellant arbitrarily refused to pay. The first notice was apparently the lawsuit, and standing alone, it cannot be a self-fulfilling notice to the employer. Thus, the trial court erred in submitting question no. 12 because there was no evidence upon which the jury could find appellant arbitrarily and capriciously denied payment of maintenance and cure to appellee. We sustain appellant's points of error eight and nine and reverse only the exemplary damages awarded. Having sustained these points, we need not address points seven, and ten.

In point of error eleven, appellant contends the trial court erred in awarding appellee prejudgment interest because, as a matter of law, appellee is not entitled to prejudgment interest. Because appellant [sic] did not request or obtain an apportionment of damages between his claims under the Jones Act and those under general maritime law, appellee [sic] asserts that he is not entitled to prejudgment interest. *See Wyatt v. Penrod Drilling Co.*, 735 F.2d 951, 955 (5th Cir. 1984).

In examining this point of error, we find that under federal law, prejudgment interest in cases involving claimants under the Jones Act and general maritime law have taken somewhat of a dual pathway. Under general maritime law, the award of prejudgment interest is "well nigh automatic." *Reeled Tubing, Inc. v. M/V Chad G.*, 794 F.2d 1026, 1028 (5th Cir. 1986). Similarly, prejudgment interest in a Jones Act claim tried to the court may be allowed at the discretion of the court. *Ceja v. Mike Hooks, Inc.*, 690 F.2d 1191, 1196 (5th Cir. 1982). However, federal courts have ruled that prejudgment interest is not available in cases brought under the Jones Act that are tried to a jury.

Simeon v. T. Smith & Son, Inc., 852 F.2d 1421, 1435 (5th Cir. 1988), *cert. denied*, 490 U.S. 1106 (1989); *Barrios v. Louisiana Construction Materials*, 465 F.2d 1157 (5th Cir. 1972); *Sanford Bros. Boats, Inc. v. Vidrine*, 412 F.2d 958, 972-73 (5th Cir. 1969); *see also Cano v. Gonzalez Trawlers, Inc.* 809 S.W.2d 238, 240 (Tex.App.—Corpus Christi 1990, no writ). One stated rationale behind denying prejudgment interest in jury-tried Jones Act cases is apparently grounded in the notion that the jury in awarding damages for the various elements makes some allowance for loss caused by delay. *See Barton v. Zapata Offshore Co.*, 397 F.Supp. 778, 779-780 (E.D. La. 1975); *Moore-McCormack Lines, Inc. v. Richardson*, 295 F.2d 583, 593-94 (2d Cir. 1961), *cert. denied*, 368 U.S. 989 (1962). Another stated reason for this rule is that a large part of the damage award in such cases is attributable to future lost wages and future medical expenses, and prejudgment interest is not necessary under federal law to compensate for losses which have not yet accrued. *Wyatt v. Penrod Dilling Co.*, 735 F.2d 951, 955 n.3 (5th Cir. 1984).

The U.S. Fifth Circuit Court of Appeals has extended its prejudgment interest rationale to encompass cases such as this, where the recovery is sought under both Jones Act negligence and the general maritime doctrine of unseaworthiness, which is tried to a jury. It has ruled that "When a damage award is based on a jury verdict finding both Jones Act negligence and unseaworthiness, without providing 'any basis for determining which portion of the damage award, if any, is attributable to unseaworthiness rather than Jones Act negligence, it is impermissible to award prejudgment interest.' " *Colburn v. Bunge Towing, Inc.*, 883 F.2d 372, 378 (5th Cir. 1989). This was held to be true even though neither party suggested "that the jury be requested to allocate damages between the Jones Act and unseaworthiness claims." *McPhillamy v. Brown & Root, Inc.*, 810 F.2d 529 (5th Cir. 1987). *McPhillamy* also holds that unless "there is an evidentiary footing for separating the damages caused by unseaworthiness and Jones Act negligence, the jury cannot be asked to apportion the damages." *Id.* at 532. In that case, there was a single harm from a single cause and the court stated that "even if he [the plaintiff] had asked for apportionment, he would not have been entitled to it." *Id.* The same situation exists in this case.

Appellee counters that his claim is based primarily on general

maritime law and, therefore, he is entitled to prejudgment interest. However, that argument is considerably weakened by a review of the issues submitted to the jury and their answers thereto, on which the judgment was based. In question no. 1, the jury was asked whether appellant's negligence played even the slightest part in producing injury or illness to appellee. As previously discussed, this critical issue on causation was phrased in accordance with the Jones Act standard. Even though the jury found unseaworthiness, appellee's causation argument is clearly grounded on the Jones Act standard, and to assert that his claim is based solely on general maritime law is inconsistent with that contention and the wording of that central issue.

Appellee alternatively argues that the federal rulings on prejudgment interest in Jones Act cases tried to a jury are inconsistent with Texas law regarding prejudgment interest on damages in personal injury cases. He correctly points out that the assessment of prejudgement interest under Texas law is assigned to the trial judge if it is properly pled. No issue is submitted to the jury. *Cavner v. Qualilty Control Parking, Inc.* 696 S.W.2d 549 (Tex. 1985). Appellee concludes that this assessment of prejudgment interest by the judge is a procedural matter as opposed to a substantive one and, thus, in a Jones Act case tried to state court, the state procedural law prevails. He analogizes to the converse of federal diversity cases where the federal procedural rules are applied along with state substantive law.[8] However, it is clear that the federal courts regard prejudgment interest in maritime law as a substantive issue and that federal law prevails. *Domangue v. Penrod Drilling Co.*, 748 F.2d 999, 1000 (5th Cir. 1984); *Wyatt, supra.*

Appellee also argues that the appellant has waived any apportionment of damages to identify strictly general maritime unseaworthiness damages by failing to object or request such an apportionment. However, in view of the federal decisions in *McPhillamy, Colburn*, and *Domangue*, it is clear that there must be

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[8] Under the "reverse Erie" doctrine, federal maritime law preempts state law with respect to substantive, but not procedural matters. *Offshore Logistics, Inc. v. Tallentire*, 106 S.Ct. [sic] (1986).

an "evidentiary footing" for separating the two types of damages; and, impliedly, it is the plaintiff who must ask for an apportionment. *McPhillamy,* 810 F.2d at 532. Even more damaging to this argument is the conclusion in *McPhillamy* that where there is a single harm from a single cause, no realistic basis exists for apportioning damages; and even if plaintiff in that case had asked for an apportionment, he would not have been entitled to it. Appellee's situation is the same. His damages result from one cause, exposure to a toxic substance.

We acknowledge that if this issue of prejudgment interest were being tried under Texas substantive law, we would reach a different conclusion because, unlike the federal law, Texas law empowers only the trial judge to assess prejudgment interest on past, and with certain statutory limitations, on future damages as well. *Cavnar, supra; C & H Nationwide, Inc. v. Thompson,* 37 TEX. SUP. CT. J. 1059, 1067, (June 25, 1994); TEX. REV. CIV. STAT. ANN. art. 5069-1.05, § 6(a) (Vernon Supp. 1994). Hence, the federal rationale supporting the denial of prejudgment interest in Jones Act cases tried to a jury conflicts with the theoretical, and now statutory, basis for allowing prejudgment interest in Texas jurisprudence.

We also are aware that we are not intractably bound to follow pronouncements of the Fifth Circuit on disputed federal law issues. Rather, we are only obligated to follow decisions of the U.S. Supreme Court and the Texas Supreme Court. *Penrod v. Drilling Corp. [sic] v. Williams,* 868 S.W.2d 294, 296 (Tex. 1993). But we are also aware that *Penrod* was dealing with an issue on which federal courts of appeals were divided. Here, we find no such division of opinion between federal courts with regard to prejudgment interest in Jones Act cases. Thus, we find the weight of the numerous decisions by the fifth circuit court as to this question to be persuasive on this federal issue. Accordingly, we sustain appellants [sic] points of error number eleven and reverse the judgment for prejudgment interest awarded to appellee.

In point of error twelve, appellant claims there is insufficient evidence to support the awards for past and future lost wages. Regarding future lost wages, appellant contends the jury based its award on the following three erroneous assumptions: (1) that appellee suffered from delayed neurotoxicity; (2) that appellee was entitled to the wages of an able-bodied seaman employed year round; and (3) that

appellee's capability to work has been reduced by 90% by his exposure to Diazinon.

Appellee's counsel claims appellee attended Bowling Green University to study engineering and then attended the Merchant Marine Academy in Piney Point, Maryland. Appellee's counsel further asserts that appellee had trained with the Merchant Marine Academy for almost two years and had almost completed his training when the insecticide incident occurred. The record, however, indicates that appellee attended Bowling Green State Vocational School, Paducah Area Vocational School, and Oakridge Associated University. Appellee studied civil technology at Bowling Green and Paducah, and he studied nondestructive testing at Oakridge. It is true that appellee did not complete the courses of study at any of these schools. Appellee attended the Seafarers International Union school for merchant marines. The evidence indicated that this school is not the same as the Merchant Marine Academy and that the course of study is somewhat different. There is no indication in the record that appellee completed this training.

During the two years appellee sailed before the insecticide incident, appellee worked as a GSU, or general steward utility, which is the lowest level in the steward department of a ship. Appellee also worked as an ordinary seaman, which is the lowest level in the deck department. The level above ordinary seaman is the able-bodied seaman. An ordinary seaman must have six months experience in the deck department and pass a test to become an able-bodied seaman. The evidence showed that, in 1983, the average able-bodied seaman AB could earn a monthly salary of $4,000-6000.00.

Appellee's expert on damages was Dr. Tom Mayor. Assuming that appellee remained in the same position he had at the time of the incident, Dr. Mayor calculated the present value of appellee's future lost wages from 1983 forward at $834,753.00. This total figure includes $701,983.00 for future lost wages from the date of trial and $132,769.00 in lost wages from 1983 to the date of trial. Assuming that appellee had become an able-bodied seaman in 1984, Dr. Mayor calculated appellee's future lost wages to be approximately $2,100,000.00 and appellee's lost wages from 1983 to the date of trial at $360,000.00. The jury awarded appellee $320,000.00 in past lost wages and $1,890,000.00 in future lost wages. Thus, the jury apparently agreed

that appellee would have attained the status of able-bodied seaman.

We find that after considering all the evidence, the jury was entitled to make the inference that because of his condition, appellee was deprived of the opportunity to complete his training and attain the higher employment status. We thus find the evidence sufficient and overrule point of error twelve.

In point of error thirteen, appellant claims there is insufficient evidence to support the awards for past and future medical expenses. We have reviewed all of the evidence in regard to past and future medical expenses and find that the evidence is sufficient to support the jury's award for each of these. Appellant does not attack the evidence concerning the award of $38,000 for past medical expenses, or indicate why it is excessive, other than to refer to the lack of causation issue. As to the future medical award of $850,000, there is testimony from Dr. Johnson that the probable cost of future medical treatment would be $600,000. Appellant apparently seeks to discount Dr. Johnson's credibility by referring to the fact that he is a licensed osteopathic physician and "not a medical doctor." Dr. Austin also testified without objection that the cost of future psychological treatment for appellee would probably be $250,000. As we previously stated, the jury is entitled to judge the weight and credibility of the expert witness. We therefore find the evidence is factually sufficient to support the jury award, and overrule point of error thirteen.

In point of error fourteen appellant contends there was insufficient evidence supporting the awards for past and future physical pain and mental anguish. The evaluation of these elements does not lend itself to a precise mathematical calculation, and it is peculiarly within the discretion of the jury. We will not substitute our judgment therefor unless there is an affirmative showing of bias or prejudice. *Hancock Fabrics, Inc. v. Martin*, 596 S.W.2d 186, 188 (Tex.Civ.App—Houston [14th Dist.] 1980, writ ref'd n.r.e). After consideration of all of the evidence as to the severity and permanent nature of appellee's nerve damage, we find the evidence factually sufficient to warrant the jury's award for these elements, and overrule appellant's point of error fourteen.

In point of error fifteen, appellant contends there was insufficient evidence to support the awards for past and future physical impairment. Again, we have examined all of the evidence in the record and find

that there is sufficient evidence to show that appellant has permanent nerve damage and muscle weakness that makes him physically unstable, unable to walk long distances, and generally limits his physical activities. The evidence is ample that this condition is permanent and will therefore extend into the future. We find the evidence factually sufficient to support the jury awards for these elements. We overrule point of error fifteen.

With regard to these last three insufficiency points of error concerning damages, we have reviewed all of the evidence in the record, but we elect not to detail all of the supporting evidence inasmuch as we are affirming and not reversing these awards. This is in accordance with our review obligations on insufficiency points of error. *Pool v. Ford Motor Co.*, 715 S.W.2d at 635; *Ellis County State Bank v. Keever*, 37 TEX. SUP. CT. J. 1117, 1120, 888 S.W.2d 790 (June 25, 1994).

Accordingly, we reverse the judgment insofar as it awards exemplary damages in the amount of $1,000,000.00, each, for gross negligence and for malicious, arbitrary failure to pay maintenance and cure. We also reverse the award for prejudgment interest. We render judgment that appellee take nothing in regard to these three elements. We affirm the remainder of the judgment.

SEARS, CANNON, ELLIS and LEE, JJ., concur.

BROWN, C.J., recused.

BOWERS, J. deceased.

CONCURRING AND DISSENTING OPINION

ROBERTSON, Justice, concurring and dissenting.

Maritime Overseas Corporation appeals from a judgment rendered in favor of appellee for more that $12.6 million in damages. Appellant raises fifteen points of error challenging the sufficiency of the evidence supporting the award of damages and challenging the amounts of the awards of actual damages, the awards of punitive damages, and the exclusion of certain evidence.

This case was argued before a panel of this court in June 1992. The panel consisted of Justices Junell, Robertson, and Draughn. On December 31, 1992, a majority opinion was issued, joined in by

Justices Junell and Robertson, in which we found insufficient evidence to support the damages award. Justice Draughn dissented without an opinion. Justice Junell, not having sought reelection, retired that day. Subsequently, appellee's motion for rehearing en banc was granted and over fourteen months ago this case was re-argued before the court en banc, Chief Justice Brown not sitting because of his recusal. Since then, Justice Bowers (who was a member of the court on rehearing) has passed away. This case is ripe for resolution.

I concur in three holdings of the majority: (1) that punitive damages are not recoverable in a general maritime case, (2) that there is no evidence that appellant arbitrarily denied maintenance and cure justifying an award of punitive damages, and (3) that prejudgment interest was wrongfully awarded. However, instead of the extended discussion by the majority, I merely note that as a matter of substantive federal law, prejudgment interest is simply not recoverable when a damage award is based on a jury verdict finding both Jones Act negligence and unseaworthiness, without providing any basis for determining which portion of the damage award, if any, is attributable to the unseaworthiness rather than the Jones Act negligence. *Colburn v. Bunge Towing, Inc.*, 883 F.2d 372, 378 (5th Cir. 1989). This is true even though neither party suggests "that the jury be requested to allocate damages between the Jones Act and unseaworthiness claims." *McPhillamy v. Brown & Root, Inc.* 810 F.2d 529 (5th Cir. 1987). Further, *McPhillamy* holds that unless "there is an evidentiary footing for separating the damages caused by unseaworthiness and Jones Act negligence, the jury cannot be asked to apportion the damages." *Id.* at 532. In that case there was a single harm from a single cause and the court stated that "even if the [the plaintiff] had asked for apportionment, he would not have been entitled to it." *Id.* The same facts are present in this case.

I dissent to the holding of the majority opinion that there is sufficient evidence to support the jury's finding that appellee suffered $8,576,000 in actual damages. Finally, I dissent to the summary disposition of appellant's points of error 13, 14 and 15 complaining of the awards for past and future medical expenses, past and future physical pain and mental anguish, and past and future physical impairment.

Appellee was a steward's assistant aboard the S/T OVERSEAS

ALASKA. On August 27, 1982, the chief steward sprayed undiluted diazinon in the galley, pantry, and dry storeroom. The next morning, crew members noticed a strong odor of insecticide and the captain ordered cleaning of the sprayed areas. Appellee participated in the clean-up for approximately five hours without any protective gear to prevent inhalation or dermal contact. Subsequently, appellee began complaining of a headache and eye irritation. When the ship reached port in New Orleans two days later, appellee received treatment at the New Orleans General Hospital emergency room.

Testimony indicated that exposure to organophosphates can lower the levels of an enzyme called acetylcholinsterase, also called cholinesterase, which is essential to the normal transmission of messages from one nerve to another. Diazonon is an organophosphate. Cholinesterase levels are measured by testing the red blood cells and the blood serum. Blood tests performed at the emergency room revealed that appellee's level of cholinesterase was depressed. Appellee's red blood cell level of cholinesterase was .40, while the average range for men of appellee's age is .44 to 1.09. Appellee's serum level of cholinesterase was .53 or .54, while the average range is 1.90 to 3.80. The examining physician, Dr. Velma Campbell, concluded that appellee suffered organophoshate exposure but determined that this exposure was not serious enough to hospitalize appellee or to administer antidote medications. Appellee received medication for eye irritation and was advised to return for a follow-up visit. Appellee returned to work and served as a crew member for appellant for the rest of that year.

In June 1983, appellee filed suit against appellant under 46 U.S.C.A. § 688 (the Jones Act) alleging gross negligence, and under general maritime law alleging unseaworthiness. Appellee claimed that he was suffering from delayed neurotoxic effects caused by the exposure to diazinon. Appellee's deposition testimony and the testimony regarding his medical records indicate that appellee continued to suffer from eye problems, that he had trouble sleeping, that he was depressed, anxious, and had memory problems, that he had high blood pressure, and that he suffered gastrointestinal problems. Appellee's wife testified that appellee is depressed, is more irritable, has headaches, muscle weakness, memory problems, and has been unable to hold a job.

The jury found in favor of appellee on both claims and awarded appellee approximately $12.6 million including $1 million in punitive damages, and $1 million in exemplary damages for failure to pay maintenance and cure. The trial court awarded appellee an additional $1,871,728.00 in prejudgment interest.

In point of error one, appellant contends the trial court erred in denying appellant's motion for a new trial because there is insufficient evidence to support the jury finding that appellee suffered $8,576,000.00 in actual damages. Appellant concedes that appellee suffered short-term effects from the exposure to diazinon. Thus, appellant does not contest damages for the medical treatment appellee received in New Orleans in 1982 or for the loss of two days of work. Appellant does contest damages awarded for appellee's claim of delayed neurotoxicity on the ground that appellee's expert testimony was speculative and not based on reasonable medical probability.

A trial court has wide discretion in granting a motion for new trial. *Champion Int'l Corp. v. Twelfth Court of Appeals*, 762 S.W.2d 898, 899 (Tex. 1988). We must uphold the trial court's decision absent a showing of a manifest abuse of discretion. *Id.* Because appellant contends there was factually insufficient evidence to support the award of damages, we must consider, weigh, and examine all of the evidence. *Plas-Tex., Inc. v. United States Steel Corp.*, 772 S.W.2d 442, 445 (Tex. 1989). We may set aside the verdict only if the evidence is too weak to support the finding, or if the finding is so against the overwhelming weight of the evidence that it is manifestly unjust and clearly wrong. *See Garza v. Alviar*, 395 S.W.2d 821, 823 (Tex. 1965).

Appellant asserts that we must apply federal law to this case because appellee's causes of action are both federal causes of action. The Texas supreme court has stated:

> Where applicable *and* properly invoked, general maritime law preempts state causes of action and remedies, consistent with the longstanding desire of Congress and the judiciary to achieve uniformity in the exercise of admiralty jurisdiction.

Texaco Refining & Marketing v. Estate of Dau Van Tran, 808 S.W.2d 61, 64 (Tex. 1991), *cert. denied*, 112 S.Ct. 301 (1991). In *Texaco*, the court was determining whether a plaintiff could recover mental

anguish damages, allowed under state law, but prohibited under general maritime law. *Id.* at 63. Because the court found that the plaintiff had properly invoked remedies under general maritime law, the court reversed the award of damages for mental anguish. *Id.* at 64. In *American Dredging Company v. Miller,* 114 S.Ct. 981 (1994), the supreme court made it clear that in exercising *in personam* jurisdiction in a maritime case, a state court may adopt such remedies and attach to them such incidents as it sees fit so long as it does not attempt to make changes in the "substantive maritime law." There, the court held that the doctrine of *forum non conveniens* concerned procedural as opposed to substantive law and that, therefore, the federal law on the subject did not preempt state law. *Id.* at 983. *See also Exxon Corporation v. Chick Kam Choo,* 881 S.W.2d 301 (Tex. 1994) (37 Tex. S. Ct. J. 914, decided June 8, 1994). Since the question of causation is one of substantive law, our review of the case law convinces me that federal case law regarding evidence of causation should control in this case.

Generally, however, Texas law is consistent with federal law regarding expert testimony on causation. To recover damages, a plaintiff must prove by competent evidence a causal nexus between the event sued upon and the injuries alleged. *See Morgan v. Compugraphic Corp.*, 675 S.W.2d 729, 732 (Tex. 1984). "Causal connection . . . must rest in reasonable probabilities; otherwise, the inference that such actually did occur can be no more than speculation and conjecture." *Insurance Co. of North America v. Myers,* 411 S.W.2d 710, 713 (Tex. 1966). *See also Gideon v. Johns-Manville Sales Corp.*, 761 F.2d 1129, 1137 (5th Cir. 1985). Whether the evidence rests in reasonable probabilities depends upon the substance of the expert's testimony. *Myers,* 411 S.W.2d at 713. "Expert testimony that the event is a possible cause of the condition cannot ordinarily be treated as evidence of reasonable medical probability except when, in the absence of other reasonable causal explanation, it becomes more likely than not that the condition did result from the event." *Lenger v. Physician's Gen. Hosp.*, 455 S.W.2d 703, 706 (Tex. 1970).

Toxic tort cases such as this present juries with questions upon which medical or scientific experts may disagree. *See Brock v. Merrell Dow Pharmaceuticals, Inc.*, 874 F.2d 307, 309 (5th Cir.), *modified on reh'g,* 884 F.2d 167 (5th Cir. 1989), *cert. denied,* 494 U.S. 1046,

(1990) (hereinafter referred to as *Brock I* and *Brock II*). Whether a substance caused an injury is a scientific question that requires the testimony of expert medical professionals. *See Insurance Co. of North America v. Myers*, 411 S.W.2d 710, 713 (Tex. 1966). An expert's testimony "must be based upon 'reasonable medical probability', as opposed to a mere 'possibility', since almost anything is 'possible' in the field of medicine." *Duff v. Yelin*, 721 S.W.2d 365, 370 (Tex.App.—Houston [1st Dist.] 1986), *aff'd*, 751 S.W.2d 175 (Tex. 1988). Thus, if the proof consists of mere medical possibilities, it is insufficient to establish a causal connection. *Duff*, 751 S.W.2d at 176.

Confronting a challenge to the evidence of causation in a toxic tort case, the Fifth Circuit held that courts should "critically evaluate the reasoning process by which the experts connect data to their conclusions in order for courts to consistently and rationally resolve the disputes before them." *Brock I*, 874 F.2d at 310. In *Brock*, the Fifth Circuit analyzed the types of evidence regarding causation typically offered in a toxic tort case. The court noted that the most useful and conclusive type of evidence is the epidemiological study which attempts "to define a relationship between a disease and a factor suspected of causing it. . . . " *Id.* at 311. Regarding such studies, the court added:

> To define the relationship [between a disease and its alleged cause], the epidemiologist examines the general population, comparing the incidence of the disease among those people exposed to the factor in question to those not exposed. The epidemiologist then uses statistical methods and reasoning to allow her to draw a biological inference between the factor being studied and the disease's etiology.

Id. As the court also mentioned, epidemiological studies do not necessarily exclude other possible causes for the same disease. *Id.* Two epidemiological studies of the effects of the drug Bendectin were admitted into evidence in *Brock*. *See id.* at 312. One study did not support a causal connection between Bendectin and birth defects. *Id.* The other study found a greater risk of birth defects, but that the risk was not statistically significant. *Id.* Because the plaintiffs did not

present any statistically significant epidemiological proof that the drug causes birth defects, the court held that the evidence was insufficient to enable a trier of fact to make a reasonable inference as to causation.[1] *See id.* at 315; *Brock II*, 884 F.2d at 167.

In a later case, the Fifth Circuit again addressed questions about an expert's testimony regarding causation in a toxic tort case. *See Christophersen v. Allied-Signal Corp.*, 939 F.2d 1106 (5th Cir. 1991), *cert. denied*, 112 S.Ct. 1280 (1992). In *Christophersen*, the trial court had excluded an expert's opinions that exposure to certain chemicals at a plant caused cancer. *Id.* at 1109. In determing whether the trial court erred in excluding this testimony, the Fifth Circuit set forth three threshold requirements for the adminisibility of expert testimony: (1) whether the witness is qualified to express an expert opinion on the topic at issue, (2) whether the data upon which the expert relies are of the same type other experts in the field reasonably rely upon in forming their opinions, and (3) whether in reaching his conclusion, the expert used a "well-founded methodology or mode of reasoning, one 'sufficiently established to have gained general acceptance in the particular field in which it belongs'." *Id.* at 1110-11. Even if the testimony meets these three requirements, it may still be excluded if the testimony's "potential for unfair prejudice substantially outweighs its probative value." *Id.* at 1110. *See also* FED. R. EVID. 403.

The trial court in *Christophersen* had criticized the expert's testimony on the grounds that the facts and data underlying the opinion were inaccurate and incomplete and that the expert offered no scientific methodology to support his conclusion. *Id.* at 1113-15. In reviewing these criticisms, the Fifth Circuit first found that the expert over-estimated the duration of the decedent's exposure to certain chemicals

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[1] In *Brock I*, the Fifth Circuit found "the lack of conclusive epidemiological proof to be fatal to the Brock's case." 874 F.2d at 313. On rehearing, the court changed this sentence and others indicating a requirement of conclusive epidemiological studies to a requirement of "statistically significant epidemiological proof." *Brock II*, 884 F.2d at 167.

and had no accurate data regarding the chemical composition of the fumes in the plant where the alleged exposure occurred. *Id.* at 1113. Thus, the court agreed that the trial court could properly reject expert opinions founded on critical facts that are untrustworthy. *Id.* at 1114. The expert in question also testified that the kind of evidence most often used to establish causation are epidemiological studies, animal testing, and *in vitro* testing. *Id.* at 1115. Despite his testimony regarding the main methodologies, this expert offered no methodology to support his conclusion that the types of chemicals used at the plant were associated with the form of cancer found in the decedent. *Id.* Because the expert offered no well-founded methodology to support his opinion regarding causation, the Fifth Circuit concluded that the expert's opinion was no more than a scientific hunch and was inadequate to support a judgment in favor of the plaintiff. *Id.*

Appellee contends that *Christophersen* has lessened the *Brock* requirements for evidence supporting causation in toxic tort cases. I disagree. Neither *Brock* nor *Christophersen* holds that epidemiological studies are required to establish causation in toxic tort cases; however, both cases note their importance. *See Brock I*, 874 F.2d at 313; *Christophersen*, 939 F.2d at 1115. Furthermore, both cases indicate that expert opinions unsupported by some type of well-founded scientific reasoning or methodology constitute mere speculation, insufficient to support a judgment. *See Brock I*, 874 F.2d at 315; *Christophersen*, 939 F.2d at 115. Both *Brock* and *Christophersen* have now been strengthened by *Daubert v. Merrell Dow, Inc.*, 113 S.Ct. 2786 (1993).

Based on the standards set forth in *Brock* and *Christophersen*, and now *Daubert*, appellant contends the conclusions of appellee's experts amounted to speculation because they were unsupported by scientific studies or other well-founded methodologies establishing a link between diazinon exposure and delayed neurotoxicity. My review of the evidence leads me to agree. Appellee's syllogism,[2] which

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[2] Appellee asserts and the majority seems to agree that because diazinon is an organophosphate, a scientific study that links any organophosphate to neuropathy or neurotoxicity should be sufficient to link diazinon to neurotoxicity. This rational runs contrary to all

appears to have been adopted by the majority, is:

> Some organophosphates can cause delayed neurotoxicity;
> Diazinon is an organophosphate;
> Diazinon, therefore, must cause delayed neurotoxicity.

This is a fallacy. The issue, as framed by the majority, is not whether organophosphates cause delayed neurotoxicity; the issue is simply, does exposure to diazinon, one of many organophosphates, cause delayed neurotoxicity?

While the United States Supreme Court was faced with the question of the *admissibility* of evidence in *Daubert*, the same principles the court there announced apply to *weighing the sufficiency of the evidence*. Indeed, in approving *Brock v. Merrell Dow Pharmaceuticals*, referred to above, the *Daubert* court sanctioned the reversal of the judgment for insufficient evidence of causation "rather than wholesale exclusion under an uncompromising 'general acceptance' test," noting that devices such as reversal of a judgment or direction of judgment are "the *appropriate safeguards* where the basis of scientific testimony meets the standards of Rule 702."

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commonly understood scientific principles. "Organophosphate" is a broad chemical family name that encompasses a diverse group of compounds. For example, ATP (adenine triphosphate) is also an organophosphate. ATP, however, occurs naturally in the human body, and relatively large amounts of ATP are essential for our metabolism and energy production. Exposure to ATP certainly does not cause neurotoxicity; however, under the majority's rationale, simply because ATP is an organophosphate and scientific studies have linked some organophosphates to neurotoxicity, ATP must also be linked to neurotoxicity. Diazinon is a distinct chemical compound, one of many different organophosphates, and is itself marketed under a variety of brand names (e.g. "Spectricide"). In fact, appellee's exhibit 6.3 lists over 30 different organophosphate pesticides in an appendix, each with its unique chemical name and composition.

(emphasis supplied). 113 S.Ct. at 2798.

The *Daubert* court held that the subject of an expert's testimony must be "scientific knowledge." *Id.* at 2795. "Scientific," the court said, "implies a grounding in the methods and procedures of science;" and that the word "knowledge" "connotes more than subjective belief or unsupported speculation." *Id.* Finally, in order to qualify as "scientific knowledge," "an inference or assertion must be derived by the scientific method." *Id.*

Daubert commands that in determining whether the reasoning or methodology underlying "expert testimony" is scientifically valid, "many factors will bear on the inquiry." *Id.* 113 S.Ct. at 2796. While not setting forth a "definitive checklist or test," the supreme court stated that the key question to be answered is "whether it can be (and has been) tested." *Id.* Other considerations are: (1) whether the theory or technique has been subjected to peer review and publication; (2) the known or potential rate of error; and (3) whether the conclusion has been generally accepted in the scientific community. *Id.* at 2797. While the court recognized the inquiry is a flexible one, "[t]he focus of course, must be *solely on principles and methodology, not on the conclusions that they generate.*" *Id.* (emphasis supplied)

Appellee offered the testimony of four experts on the issue of causation. Dr. Edward Ezrailson, who holds a Ph.D. in biochemistry, testified that he has studied the effects of certain organophosphates on humans, using animal tests, for the Environmental Protection Agency. Dr. Ezrailson admitted that his EPA study was of the effects of malathion and parathion on the skeletal muscle protein mebatolism in rats. No paper was published as a result of this study. Based on the amount and duration of appellee's exposure to diazinon, Dr. Ezrailson concluded that appellee's symptoms were caused, in reasonable medical probability, by this exposure.

On cross-examination, Dr. Ezrailson agreed that his research involved a review of the scientific literature. He testified that he relied, to some extent, upon the opinions of the authors writing the chapters in a textbook entitled "Toxic Effect of Pesticides." Dr. Ezrailson agreed with a statement in this text that individual compounds within a similar chemical class may range from extremely toxic to practically nontoxic. He also agreed with the statement that red blood cell cholinesterase, rather than that in blood plasma, provided a more accurate reflection

of the inhibition of acetylcholinesterase in the nerve cells. Dr. Ezrailson testified that the average time for restoration of acetylcholinesterase in a person with diazinon exposure was two weeks to three months.

Dr. Ezrailson testified that he based his conclusion, at least in part, on his review of the scientific literature. Although Dr. Ezrailson testified about fourteen different scientific articles regarding the effects of exposure to organophosphates,[3] the record contains only two articles

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[3] Dr. Ezrailson's testimony referenced the following articles: (1) "Sequelae of Acute Organophosphate Poisoning" by Dr. I. R. Tabershaw, which concluded that exposure to certain organophosphates can result in delayed symptoms (did not list diazinon as one of the organophosphates studied): (2) "Delayed Neurotoxicity and Other Consequences of Organophosphates Esterase," by Ronald Baron, not admitted into evidence, noting that certain organophosphates have been shown to cause a delayed neurotoxic effect, but that this neuropathy is always proceeded by a period of approximately 7-14 days (article did not mention diazinon); (3) "Correlations Between Recovery Rate of Neurotoxic Esterases and Sensitivity of the Organic and Phosphate Induced Delayed Neurotoxicity," by Carrington, not admitted into evidence but does not even mention diazinon; (4) "Long Term Effects of the Organophosphate Sarin on EEG in Monkeys and Humans," by Duffey and Burchfiel, not admitted into evidence, stating that many, but not all organophosphates have been found to cause delayed neurotoxicity; (5) two articles by Finkelstein entitled, "Brain Acetylcholinesterase After Acute Parathion Poisoning," and "CNS Involvement in Acute Organophosphate Poisoning: Specific Pattern of Toxicity, Clinical Correlates, and Antidotal Treatment," both of which concerned parathion and neither were admitted into evidence but does not consider or discuss diazinon; (6) "Anxiety Associated with Exposure to Organophosphate Compounds," by Levin, not admitted into evidence, which concerned effects on farm workers who received chronic exposure to organophosphates and found no relationship between exposure and depression; (7) "Behavioral Effects of Organophosphate Pesticides in Men" by Levin and Midski, not admitted into evidence; (8) "Spatial Memory Impairment and Central Muscarinic Receptor Loss Following Prolonged Treatment with

that were actually admitted into evidence.[4] A review of the testimony indicates that only two articles addressed the effects of diazinon exposure, and these concerned fatal ingestion or poisoning. *None of*

Organophosphate" by McDonald, not admitted into evidence, which studied the effects following daily exposure to two insecticides, not including diazinon, over a fourteen-day period; (9) "Delayed Neurotoxic Effects of some Organophosphorous Compounds," by Johnson, not admitted into evidence, delayed neurotoxicity manifests itself 7-14 days after exposure but not all organophosphates induce delayed neurotoxicity; (10) "Evidence of Necrosis in Human Intercostal Muscles," by Wecker, Mrak, and Dettbarn, not admitted to evidence, which concerned a study of a man who received a fatal dose of malathion and diazinon but did not link diazinon to delayed neurotoxicity; (11) "Fatal Diazinon Poisoning in Man," by Hendricks, not admitted into evidence, which concerned a person who committed suicide by ingesting diazinon but did not link diazinon with delayed neurotoxicity; (12) "Central Actions of Organophosphate Agents," by Karczmar, not admitted into evidence, which studied the mental effects of exposure to certain organophosphates, not including diazinon; (13) "Organophosphate Polyneuropathy," by Lotty, not admitted into evidence, that concluded symptoms of organophosphate induced delayed neurotoxicity usually begin one to three weeks after acute exposure and lists six chemicals that cause delayed neurotoxicity but does not list diazinon.

[4] The two studies admitted into evidence include: (1) "Chronic Neurological Sequelae of Acute Organophosphate Pesticide Poisoning," by Savage, Keefe, Mounce, Heaton, Lewis and Burcar, offered into evidence by appellee which evaluated the latent neurological effects of organophosphate poisoning on 100 patients, none of which had been exposed to diazinon; and (2) "Pesticides & brain-function changes in a controlled environment" by Rea, Butler, Laseter, and DeLeon, offered into evidence by appellant, which studied whether environmentally controlled conditions improve the symptoms of patients who have been exposed to pesticides, other than diazinon.

the articles concludes that diazinon causes delayed neurotoxicity. Testimony about the conclusions of some of the articles indicated that symptoms of delayed neurotoxicity caused by certain organophosphates usually occur within one to three weeks after exposure.

Another expert witness for appellee was Dr. Alfred R. Johnson, a Doctor of Osteopathy, who works at the Environmental Health Center of Dallas, Inc. This center provides health care to the public emphasizing the health effect and treatment of environmental exposure. Dr. Johnson testified that he has treated appellee and other patients suffering from exposure to diazinon or other similar chemicals. Dr. Johnson's diagnosis was "organophosphate toxic exposure with relating damage in the form of delayed toxicity reaction and permanent nerve damage," but that he had not seen anyone, other than Ellis, who had delayed neurotoxicity from diazinon exposure. Dr. Johnson testified that exposure to diazinon can cause delayed central nervous system sysptoms and that the length of time before such symptoms appear can vary with the individual from a couple of weeks to a few months. Dr. Johnson testified that, in his opinion, based upon reasonable medical probability, appellee's current problems were caused by the August 1982 exposure to diazinon. Dr. Johnson based this diagnosis on his examination of appellee and on a review of appellee's medical records showing exposure to diazinon and depressed levels of cholinesterase. Dr. Johnson testified that he was familiar with the literature regarding organophosphate poisoning, but he could not recall any studies dealing only with diazinon and the long-term effects of diazinon exposure on humans.

Appellee also called Dr. Francis J. Waickman as an expert witness. Dr. Waickman's area of specialty is pediatrics, but he has taken postgraduate courses in many areas, including allergy, toxicology, and clinical immunology. He is board certified in pediatrics, allergy, clinical immunology, utilization review and quality assurance, and environmental medicine. Dr. Waickman evaluates and treats people who have chemical sensitivities and who have been exposed to pesticides. In his examination of appellee, Dr. Waickman found symptoms of central nervous system involvement. Specifically, Dr. Waickman found slow verbal responses and below normal reasoning and recall. Based on his examination, Dr. Waickman testified that appellee's problems are delayed neurotoxic effects from diazinon

exposure. Dr. Waickman testified that he is familiar with the scientific literature regarding diazinon and organophosphates and he has no doubts that these chemicals can cause long-term effects on human beings. Dr. Waickman, however, offered no case histories or studies of any kind, nor any personal experiences with patients or research, linking diazinon with delayed neurotoxicity.

Finally, appellee offered the testimony of Dr. Richard Austin, a clinical psychologist who has had experience treating people who have been poisoned by various chemicals. Dr. Austin personally examined and evaluated appellee, gave him a battery of psychological tests, reviewed the medical records of doctors who had treated appellee, elicited historical information from appellee's family and friends, and reviewed scientific literature regarding organophosphate poisoning. Dr. Austin concluded that appellee suffered nervous system damage resulting in emotional problems caused by the chemical poisoning in 1982. Dr. Austin was familiar with a study, admitted into evidence, that was performed on behalf of the EPA by Drs. Savage, Keefe, and others, entitled "Chronic Neurological Sequelae of Acute Organophosphate Pesticide Poisoning." This study involved testing of individuals chronically exposed to a variety of pesticides, not including diazinon. Dr. Austin agreed that appellee suffers from many of the same impairments and exhibits similar test results to those discussed in the literature resulting from organophosphate poisoning. Dr. Austin testified that there are authoritative studies showing that organophosphate poisoning can cause delayed neurotoxic effects. The testimony regarding *these studies indicated no conclusion that diazinon causes delayed neurotoxicity.*

Finally, the majority relies upon the testimony of Dr. James Carter, described as "a family doctor" from Ellis' hometown. Dr. Carter, however, never treated Ellis until almost two years after his diazinon exposure. While Dr. Tim Lee Carter (Dr. James Carter's uncle) purpotedly saw Ellis five or six months after his exposure, there is no documentation of that visit in *any* medical records. The first indication of a visit even to Dr. Tim Lee Carter is a letter Tim Lee Carter wrote to appellee's counsel in August of 1983. That letter does not describe any of the symptoms Dr. James Carter later claimed Ellis had; instead, it merely asks appellee's counsel to keep him apprised of any progress in the litigation. There is then a record of three visits

in 1984. Dr. Tim Lee Carter prescribed an antibiotic in February, associated with a complaint of fever, another antibiotic for a cold in May, and later prescribed Tagament, used in treating peptic ulcers, in October. Dr. James Carter saw Ellis briefly for the flu in May 1984 and did not see Ellis again until 1986. Other than visits for a ingrown toenail and bronchitis, Dr. Carter's medical records are unremarkable.

Unlike the expert in *Christophersen*, the expert witnesses here based their opinions on accurate underlying facts, such as estimation of the duration of appellee's exposure to diazinon. Thus, we should turn to whether there was sufficient evidence supporting the experts' testimony that, in reasonable medical probability, diazinon caused the injuries alleged by appellee. *Brock* and *Christophersen* require that an expert's conclusions regarding causation rest upon a well-founded scientific methodology. *See Brock I*, 874 F.2d at 315; *Christophersen*, 939 F.2d at 1115. *Daubert* requires that an expert's conclusions regarding causation rest upon "scientific knowledge." 113 S.Ct. at 2795. Appellee's experts all testified that they based their conclusions on past experience treating patients exposed to organophosphates and/or on published scientific studies showing a connection between exposure to organophosphates and delayed neurotoxicity. These experts admitted, however, that none of the published studies documented a connection between delayed neurotoxicity and exposure to diazinon. Only one study referenced by appellee's experts addressed diazinon and this study concerned a fatal ingestion of the pesticide and not whether a less than fatal exposure can cause delayed neurotoxicity. Testimony also indicated that the effects of exposure to compounds within a similar chemical class can vary widely.

Appellant presented the testimony of three doctors, Dr. Velma Campbell, Dr. Eric Comstock, and Dr. Francisco Perez. Dr. Campbell treated appellant in the emergency room at the New Orleans General Hospital. Campbell testified that some pesticides can cause delayed neurological symptoms, but that to her knowledge, diazinon is not one of these.

Dr. Perez is a clinical psychologist specializing in neuropsychology and behavioral medicine. Perez did not examine appellant, but reviewed his medical and psychological records and reviewed the literature regarding organophosphates. Perez testified that a worsening

of a patient's psychological condition is not a typical symptom caused by exposure to diazinon. Perez concluded, based on his review of the records and literature, that appellant's symptoms are most likely unrelated to the diazinon exposure.

Dr. Eric Comstock, a medical toxicologist, testified that he had experience treating persons exposed to toxic substances, 80-100 of which involved diazinon. Comstock also reviewed appellant's medical records and the literature about organophosphates, but did not examine appellant. Comstock agreed that appellant initially exhibited mild acute effects from the exposure, including eye irritation, slight weakness, diarrhea, headaches, and vomiting, but based on his experience and review of the records and literature, Comstock concluded that appellant has suffered no delayed effects related to the diazinon exposure.

Comstock testified that diazinon is an "unrestricted use" pesticide, which means that it does not cause or has not been shown to cause severe, impairing long-term effects. Comstock noted that his personal experience treating persons exposed to diazinon has not indicated that diazinon causes delayed neurotoxicity. Furthermore, Comstock testified that diazinon has been widely used by the public for many years and that, if it caused delayed neurotoxicity, this would have been identified. Finally, Comstock testified that none of the literature supports the conclusion that diazinon causes delayed neurotoxicity, and that there is literature concluding diazinon does not cause delayed neurotoxicity.[5]

Even if expert testimony rests upon a well-founded methodology, it will nevertheless be insufficient to support a finding of causation if the studies or tests fail to show a statistically significant relationship between exposure to the substance and the kind of injury alleged. *See Brock I*, 874 F.2d at 315; *Brock II*, 884 F.2d at 167. Although the studies relied upon by appellee's experts support a conclusion that certain pesticides falling within the organophosphate classification can cause delayed neurotoxicity, these studies do not establish any relationship, statistically significant or otherwise, between diazinon

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[5] Comstock specifically noted that the article entitled "Poisoning Due to Organophosphate Insecticides," (author unknown) concluded that diazinon, as well as certain other insecticides, did not produce neuropathy.

and delayed neurotoxicity. Absent a well-founded scientific methodology showing some connection between exposure to diazinon and the kind of injuries alleged by appellee, the conclusions of appellee's experts regarding causation were speculative and insufficient to enable the jury to make a reasonable inference as to causation. *See Brock I*, 874 F.2d at 315; *Brock II*, 884 F.2d at 167. None of appellees experts had ever seen or treated a single person with "delayed neurotoxicity" due to diazinon poisoning. Despite over thirty years of diazinon's wide use, including use as a common household pesticide, the appellee's experts could not point to a single case history, animal study or *in vitro* study—much less any epidemiological study on humans—to link diazinon as a cause of delayed neurotoxicity. The majority has not undertaken the review commanded by *Daubert* of the "reasoning or methodology underlying the testimony" to assess its scientific validity. Because there is no "scientific knowledge," as commanded by *Daubert*, concluding that diazinon causes *delayed neurotoxicity*, appellee's damages should be limited to those resulting from short-term exposure. Consequently, appellant's first point of error should be sustained.

The majority dismiss appellant's complaints on the amounts of damages awarded for past and future medical expenses, past and future physical pain and mental anguish, and past and future physical impairment with the bare conclusion that all the evidence has been considered and we "find it sufficient to support the jury's findings." I disagree.

The jury awarded $38,000 for past medical expenses and $850,000 for future medical expenses. In point of error 13, appellant sought a new trial or a remittitur based upon insufficient evidence. I believe appellant is entitled to a remittitur as to future medical expenses for two reasons. First, there is insufficient evidence, as discussed in the first point, that appellant's injuries resulted from exposure to diazinon. However, there is the further reason that the award of $850,000 is excessive. Dr. Johnson, an osteopath, testified appellant's future medical expenses would probably be $600,000,[6] based upon a $10,000

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[6] Dr. Austin, the psychologist, estimated appellee's future psychological treatment costs to be $250,000.

a year program of vitamin C injections, regular doctor visits, clean living, and sauna-type therapy. This award is shockingly excessive.

The jury awarded $228,000 for past physical pain and mental anguish and $4,000,000 for future physical pain and mental anguish. In point of error 14, appellant sought a new trial or a remittitur based upon insufficient evidence. In addition to the reasons discussed in the first point, I believe appellant is entitled to a remittitur.

Appellee did not testify at trial. His mother testified that "at times he feels better but has a lot of headaches and so much chest pain but has times he has felt better for a short period." Other than headaches and chest pain, appellee complains of stomach aches, insomnia, muscle aches and memory loss. This 4 million dollar award is shockingly excessive. Further, appellant argues and I agree, the awards for physical pain and suffering and for physical impairment (point of error 15) are cumulative. These awards compensate appellee for an identical injury. The only "physical impairment" that appellee can assert is the impairment due to physical pain – aches and pains and nausea. In the same vein, the only "suffering" appellee can assert is due to these very same symptoms. This is not a case of an appellee suffering actual physical damage or disfigurement, for there is no evidence of either in the record. Thus, the injuries in this case – pain and suffering and physical impairment – are indistinguishable, and to award damages for both permits a double recovery. I believe appellant is entitled to a remittitur.

The jury awarded $250,000 for past physical impairment and $1,000,000 for future physical impairment. In point of error 15 appellant sought a new trial or a remittitur because of insufficient evidence.

In addition to the reasons discussed in the first point of error, there are additional reasons why appellant's point is well-taken. Appellee offered no evidence that he has suffered or will suffer actual physical impairment. The only medical tests ever conducted on appellee, including neurological tests such as EEG and peripheral nerve tests, have been normal. The evidence offered – limited to appellee's description of his symptoms, and opinions that his verbal responses are "slow," and that he "looks older than his chronological age," – is insufficient to support an award for physical impairment. To recover for past and future impairment

> [the] injured party must sustain the burden of proving that the effect of his physical impairment extends beyond any impediment to his earning capacity and *beyond* any pain and suffering to the extent that it produces a separate and distinct loss that is substantial and for which he should be compensated.

Allen v. Whisenhunt, 603 S.W.2d 242, 243 (Tex.Civ.App.–Houston [14th Dist.] 1981, writ dism'd) (emphasis added). In this case, Ellis has not proved that the effect of his impairment extends beyond any pain and suffering and loss of earning capacity. *See also Valdez v. Church's Fried Chicken*, 683 F.Supp. 596, 615 (W.D. Tex. 1988) (no recovery for physical manifestations–avoidance of stimuli, difficulty sleeping, etc.–related to the mental anguish). I believe appellant, at the very least, is entitled to a remittitur.

For all the reasons discussed, I respectfully dissent.

MURPHY, J., concurs in this opinion.

APPENDIX G

MARITIME OVERSEAS CORPORATION, APPELLANT,

v.

RICHARD ELLIS, APPELLEE.

No. C14-91-00795-CV.

Court of Appeals of Texas,
Houston (14th Dist.).

1992 TEX. APP. LEXIS 327

DECEMBER 31, 1992, FILED

OPINION BY: SAM ROBERTSON

Maritime Overseas Corporation appeals from a judgment rendered in favor of appellee for over $12.6 million in damages. Appellant raises fifteen points of error challenging sufficiency of the evidence supporting the award of damages and challenging the amounts of the awards of actual damages, the awards of punitive damages, and the exclusion of certain evidence. Because we find insufficient evidence to support the damages award, we reverse and remand.

Appellee was a steward's assistant aboard the S/T OVERSEAS ALASKA. On August 27, 1982, the chief steward sprayed undiluted diazinon in the galley, pantry, and dry storeroom. The next morning, crew members noticed a strong odor of insecticide and the captain ordered cleaning of the sprayed areas. Appellee participated in the clean-up for approximately five hours without any protective gear to prevent inhalation or dermal contact. Subsequently, appellee began complaining of a headache and eye irritation. When the ship reached port in New Orleans two days later, appellee received treatment at the New Orleans General Hospital emergency room.

Testimony indicated that exposure to organophosphates can lower the levels of an enzyme called acetylcholinesterase, also called cholinesterase, which is essential to the normal transmission of messages from one nerve to another. Diazinon is an organophosphate. Cholinesterase levels are measured by testing the red blood cells and

the blood serum. Blood tests performed at the emergency room revealed that appellee's level of cholinesterase was depressed. Appellee's red blood cell level of cholinesterase was .40, while the average range for men of appellee's age is .44 to 1.09. Appellee's serum level of cholinesterase was .53 or .54, while the average range is 1.90 to 3.80. The examining physician, Dr. Velma Campbell, concluded that appellee suffered organophosphate exposure but determined that this exposure was not serious enough to hospitalize appellee or to administer antidote medications. Appellee received medication for eye irritation and was advised to return for a follow-up visit. Appellee returned to work and served as a crew member for appellant for the rest of that year.

In June 1983, appellee filed suit against appellant under 46 U.S.C.A. § 688 (the Jones Act) alleging gross negligence, and under general maritime law alleging unseaworthiness. Appellee claimed that he was suffering from delayed neurotoxic effects caused by the exposure to diazinon. Appellee's deposition testimony and the testimony regarding his medical records indicate that appellee continued to suffer from eye problems, that he had trouble sleeping, that he was depressed, anxious, and had memory problems, that he had high blood pressure, and that he suffered gastrointestinal problems. Appellee's wife testified that appellee is depressed, is more irritable, has headaches, muscle weakness, memory problems, and has been unable to hold a job.

The jury found in favor of appellee on both claims and awarded appellee approximately $12.6 million including $1 million in punitive damages, and $1 million in exemplary damages for failure to pay maintenance and cure. The trial court awarded appellee an additional $1,871,728.00 in prejudgment interest.

In point of error one, appellant contends the trial court erred in denying appellant's motion for a new trial because there is insufficient evidence to support the jury finding that appellee suffered $8,576,000.00 in actual damages. Appellant concedes that appellee suffered short-term effects from the exposure to diazinon. Thus, appellant does not contest damages for the medical treatment appellee received in New Orleans in 1982 or for the loss of two days of work. Appellant does contest damages awarded for appellee's claim of delayed neurotoxicity on the ground that appellee's expert testimony was

speculative and not based on reasonable medical probability.

A trial court has wide discretion in granting a motion for a new trial. *Champion Int'l Corp. v. Twelfth Court of Appeals*, 762 S.W.2d 898, 899 (Tex. 1988). We must uphold the trial court's decision absent a showing of a manifest abuse of discretion. *Id.* Because appellant contends there was factually insufficient evidence to support the award of damages, we must consider, weigh, and examine all of the evidence. *Plas-Tex, Inc. v. United States Steel Corp.*, 772 S.W.2d 442, 445 (Tex. 1989). We may set aside the verdict only if the evidence is too weak to support the finding, or if the finding is so against the overwhelming weight of the evidence that it is manifestly unjust and clearly wrong. *See Garza v. Alviar*, 395 S.W.2d 821, 823 (Tex. 1965).

Appellant asserts that we must apply federal law to this case because appellee's causes of action are both federal causes of action. The Texas Supreme Court has stated:

> Where applicable and properly invoked, general maritime law preempts state causes of action and remedies, consistent with the longstanding desire of Congress and the judiciary to achieve uniformity in the exercise of admiralty jurisdiction.

Texaco Refining & Marketing v. Estate of Dau Van Tran, 808 S.W.2d 61, 64 (Tex. 1991), *cert. denied*, 112. S. Ct. 301 (1991). In *Texaco*, the court was determining whether a plaintiff could recover mental anguish damages, allowed under state law, but prohibited under general maritime law. *Id.* at 63. Because the court found that the plaintiff had properly invoked remedies under general maritime law, the court reversed the award of damages for mental anguish. *Id.* at 64. Although we do not interpret this case to hold that a state court entertaining a Jones Act or general maritime cause of action may only look to federal case law for guidance,[1] our review of the case law convinces us that federal case law regarding evidence of causation should control in this case.

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[1] Indeed, the Texas Supreme Court has recently held that federal maritime law does not preempt the State's limitations on its consent to be sued. *State Dept. of Highways v. Dopyera*, 834 S.W.2d 50, 53 (Tex. 1992).

Generally, Texas law is consistent with federal law regarding expert testimony on causation. To recover damages, a plaintiff must prove by competent evidence a causal nexus between the event sued upon and the injuries alleged. See *Morgan v. Compugraphic Corp.*, 675 S.W.2d 729, 732 (Tex. 1984). "Causal connection . . . must rest in reasonable probabilities; otherwise, the inference that such actually did occur can be no more than speculation and conjecture." *Insurance Co. of North America v. Myers*, 411 S.W.2d 710, 713 (Tex. 1966). *See also Gideon v. Johns-Manville Sales Corp.*, 761 F.2d 1129, 1137 (5th Cir. 1985). Whether the evidence rests in reasonable probabilities depends upon the substance of the expert's testimony. *Myers*, 411 S.W.2d at 713. "Expert testimony that the event is a possible cause of the condition cannot ordinarily be treated as evidence of reasonable medical probability except when, in the absence of other reasonable causal explanation, it becomes more likely than not that the condition did result from the event." *Lenger v. Physician's Gen. Hosp.*, 455 S.W.2d 703, 706 (Tex. 1970).

Toxic tort cases such as this present juries with questions upon which medical or scientific experts may disagree. See *Brock v. Merrell Dow Pharmaceuticals, Inc.*, 874 F.2d 307, 309 (5th Cir.), *modified on reh'g* 884 F.2d 167 (5th Cir. 1989), *cert. denied*, 494 U.S. 1046 (1990) (hereinafter referred to as *Brock I* and *Brock II*). Whether a substance caused an injury is a scientific question that requires the testimony of expert medical professionals. See *Insurance Co. of North America v. Myers*, 411 S.W.2d 710, 713 (Tex. 1966). An expert's testimony "must be based upon 'reasonable medical probability', as opposed to a mere 'possibility', since almost anything is 'possible' in the field of medicine." *Duff v. Yelin*, 721 S.W.2d 365, 370 (Tex. App.—Houston [1st Dist.] 1986), *aff'd*, 751 S.W.2d 175 (Tex. 1988). Thus, if the proof consists of mere medical possibilities, it is insufficient to establish a causal connection. *Duff*, 751 S.W.2d at 176.

Confronting a challenge to the evidence of causation in a toxic tort case, the Fifth Circuit held that courts should "critically evaluate the reasoning process by which the experts connect data to their conclusions in order for courts to consistently and rationally resolve the disputes before them." *Brock I*, 874 F.2d at 310. In *Brock*, the Fifth Circuit analyzed the types of evidence regarding causation typically offered in a toxic tort case. The court noted that the most useful and

conclusive type of evidence is the epidemiological study which attempts "to define a relationship between a disease and a factor suspected of causing it. . . . " *Id.* at 311. Regarding such studies, the court added:

> To define that relationship [between a disease and its alleged cause], the epidemiologist examines the general population, comparing the incidence of the disease among those people exposed to the factor in question to those not exposed. The epidemiologist then uses statistical methods and reasoning to allow her to draw a biological inference between the factor being studied and the disease's etiology.

Id. As the court also mentioned, epidemiological studies do not necessarily exclude other possible causes for the same disease. *Id.* Two epidemiological studies of the effects of the drug Bendectin were admitted into evidence in *Brock*. See *id.* at 312. One study did not support a causal connection between Bendectin and birth defects. *Id.* The other study found a greater risk of birth defects, but that the risk was not statistically significant. *Id.* Because the plaintiffs did not present any statistically significant epidemiological proof that the drug causes birth defects, the court held that the evidence was insufficient to enable a trier of fact to make a reasonable inference as to causation.[2] *See id.* at 315; *Brock II*, 884 F.2d at 167.

In a later case, the Fifth Circuit again addressed questions about an expert's testimony regarding causation in a toxic tort case. *See Christophersen v. Allied-Signal Corp.*, 939 F.2d 1106 (5th Cir. 1991), *cert. denied*, 112 S. Ct. 1280 (1992). In *Christophersen*, the trial court had excluded an expert's opinion that exposure to certain

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[2] In *Brock I*, the Fifth Circuit found "the lack of conclusive epidemiological proof to be fatal to the Brock's case." 874 F.2d at 313. On rehearing, the court changed this sentence and others indicating a requirement of conclusive epidemiological studies to a requirement of "statistically significant epidemiological proof." *Brock II*, 884 F.2d at 167.

chemicals at a plant caused cancer. *Id.* at 1109. In determining whether the trial court erred in excluding this testimony, the Fifth Circuit set forth three threshold requirements for the admissibility of expert testimony: (1) whether the witness is qualified to express an expert opinion on the topic at issue, (2) whether the data upon which the expert relies are of the same type other experts in the field reasonably rely upon in forming their opinions, and (3) whether in reaching his conclusion, the expert used a "well-founded methodology or mode of reasoning, one 'sufficiently established to have gained general acceptance in the particular field in which it belongs'." *Id.* at 1110-11. Even if the testimony meets these three requirements, it may still be excluded if the testimony's "potential for unfair prejudice substantially outweights its probative value." *Id.* at 1110. *See also* FED. R. EVID. 403.

The trial court in *Christophersen* had criticised the expert's testimony on the grounds that the facts and data underlying the opinion were inaccurate and incomplete and that the expert offered no scientific methodology to support his conclusion. *Id.* at 1113-15. In reviewing these criticisms, the Fifth Circuit first found that the expert overestimated the duration of the decedent's exposure to certain chemicals and had no accurate data regarding the chemical composition of the fumes in the plant where the alleged exposure occurred. *Id.* at 1113. Thus, the court agreed that the trial court could properly reject expert opinions founded on critical facts that are untrustworthy. *Id.* at 1114. The expert in question also testified that the kind of evidence most often used to establish causation are epidemiological studies, animal testing, and in vitro testing. *Id.* at 1115. Despite his testimony regarding the main methodologies, this expert offered no methodology to support his conclusion that the types of chemicals used at the plant were associated with the form of cancer found in the decedent. *Id.* Because the expert offered no well-founded methodology to support his opinion regarding causation, the Fifth Circuit concluded that the expert's opinion was no more than a scientific hunch and was inadequate to support a judgment in favor of the plaintiff. *Id.*

Appellee contends that *Christophersen* has lessened the *Brock* requirements for evidence supporting causation in toxic tort cases. We disagree. Neither *Brock* nor *Christophersen* holds that epidemiological studies are required to establish causation in toxic

tort cases; however, both cases note their importance. *See Brock I*, 874 F.2d at 313; *Christophersen*, 939 F.2d at 1115. Furthermore, both cases indicate that expert opinions unsupported by some type of well-founded scientific reasoning or methodology constitute mere speculation, insufficient to support a judgment. See *Brock I*, 874 F.2d at 315; *Christophersen*, 939 F.2d at 115.

Based on the standards set forth in *Brock* and *Christophersen*, appellant contends the conclusions of appellee's experts amounted to speculation because they were unsupported by scientific studies or other well-founded methodologies establishing a link between dizainon exposure and delayed neurotoxicity. Our review of the evidence leads us to agree. Appellee offered the testimony of four experts on the issue of causation. Dr. Edward Ezrailson, who holds a Ph.D. in biochemistry, testified that he has studied the effects of certain organophosphates on humans, using animal tests, for the Environmental Protection Agency. Dr. Ezrailson admitted that his EPA study was of the effects of malathion and parathion on the skeletal muscle protein metabolism in rats. No paper was published as a result of this study. Based on the amount and duration of appellee's exposure to diazinon, Dr. Ezrailson concluded that appellee's symptoms were caused, in reasonable medical probability, by this exposure.

On cross-examination, Dr. Ezrailson agreed that his research involved a review of the scientific literature. He testified that he relied, to some extent, upon the opinions of the authors writing the chapters in a textbook entitled "Toxic Effect of Pesticides." Dr. Ezrailson agreed with a statement in this text that individual compounds within a similar chemical class may range from extremely toxic to practically nontoxic. He also agreed with the statement that red blood cell cholinesterase, rather than that in blood plasma, provided a more accurate reflection of the inhibition of acetylcholinesterase in the nerve cells. Dr. Ezrailson testified that the average time for restoration of acetylcholinesterase in a person with diazinon exposure was two weeks to three months.

Dr. Ezrailson testified that he based his conclusion, at least in part, on his review of the scientific literature. Although Dr. Ezrailson testified about fourteen different scientific articles regarding the effects

of exposure to organophosphates,[3] the record contains only two

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[3] Dr. Ezrailson's testimony referenced the following articles: (1) "Sequelae of Acute Organophosphate Poisoning" by Dr. I. R. Tabershaw, which concluded that exposure to certain organophosphates can result in delayed symptoms (did not list diazinon as one of the organophosphates studied); (2) "Delayed Neurotoxicity and Other Consequences of Organophosphates Esterase," by Ronald Baron, not admitted into evidence, noting that certain organophosphates have been shown to cause a delayed neurotoxic effect, but that this neuropathy is always proceeded by a period of approximately 7-14 days (article did not mention diazinon); (3) "Correlations Between Recovery Rate of Neurotoxic Esterases and Sensitivity of the Organic and Phosphate Induced Delayed Neurotoxicity," by Carrington, not admitted into evidence; (4) "Long Term Effects of the Organophosphate Sarin on EEG in Monkeys and Humans," by Duffey and Burchfiel, not admitted into evidence, stating that many, but not all organophosphates have been found to cause delayed neurotoxicity; (5) two articles by Finkelstein entitled, "Brain Acetylcholinesterase After Acute Parathion Poisoning," and "CNS Involvement in Acute Organophosphate Poisoning: Specific Pattern of Toxicity, Clinical Correlates, and Antidotal Treatment," both of which concerned parathion and neither were admitted into evidence; (6) "Anxiety Associated with Exposure to Organophosphate Compounds," by Levin, not admitted into evidence, which concerned effects on farm workers who received chronic exposure to organophosphates and found no relationship between exposure and depression; (7) "Behavioral Effects of Organophosphate Pesticides in Men" by Levin and Midski, not admitted into evidence; (8) "Spatial Memory Impairment and Central Muscarinic Receptor Loss Following Prolonged Treatment with Organophosphate" by McDonald, not admitted into evidence, which studied the effects following daily exposure to two insecticides, not including diazinon, over a fourteen-day period: (9) "Delayed Neurotoxic Effects of Some Organophosphorous Compounds," by Johnson, not admitted into evidence; (10) "Evidence of Necrosis in Human Intercostal Muscles," by Wecker, Mrak, and Dettbarn, not admitted to evidence, which concerned a study of a man who received

articles that were actually admitted into evidence.[4] Our review of the testimony indicates that only two articles addressed the effects of diazinon exposure, and these concerned fatal ingestion or poisoning. None of the articles concludes that diazinon causes delayed neurotoxicity. Testimony about the conclusions of some of the articles indicated that symptoms of delayed neurotoxicity caused by certain organophosphates usually occur within one to three weeks after exposure.

Another expert witness for appellee was Dr. Alfred R. Johnson, a Doctor of Osteopathy, who works at the Environmental Health Center of Dallas, Inc. This center provides health care to the public emphasizing the health effect and treatment of environmental exposure. Dr. Johnson testified that he has treated appellee and other patients suffering from exposure to diazinon or other similar chemicals. Dr. Johnson's diagnosis was "organophosphate toxic exposure with relating damage in the form of delayed toxicity reaction and permanent nerve

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a fatal dose of malathion and diazinon; (11) "Fatal Diazinon Poisoning in Man," by Hendricks, not admitted into evidence, which concerned a person who committed suicide by ingesting diazinon; (12) "Central Actions of Organophosphate Agents," by Karczmar, not admitted into evidence, which studied the mental effects of exposure to certain organophosphates, not including diazinon; (13) "Organophosphate Polyneuropathy," by Lotty, not admitted into evidence, that concluded symptoms of organophosphate induced delayed neurotoxicity usually begin one to three weeks after acute exposure.

[4] The two studies admitted into evidence include: (1) "Chronic Neurological Sequelae of Acute Organophosphate Pesticide Poisoning," by Savage, Keefe, Mounce, Heaton, Lewis and Burcar, offered into evidence by appellee which evaluated the latent neurological effects of organophosphate poisoning on 100 patients, none of which had been exposed to diazinon; and (2) "Pesticides & brain-function changes in a controlled environment" by Rea, Butler, Laseter, and DeLeon, offered into evidence by appellant, which studied whether environmentally controlled conditions improve the symptoms of patients who have been exposed to pesticides, other than diazinon.

damage." Dr. Johnson testified that exposure to diazinon can cause delayed central nervous system symptoms and that the length of time before such symptoms appear can vary with the individual from a couple of weeks to a few months. Dr. Johnson testified that, in his opinion, based upon reasonable medical probability, appellee's current problems were caused by the August 1982 exposure to diazinon. Dr. Johnson based this diagnosis on his examination of appellee and on a review of appellee's medical records showing exposure to diazinon and depressed levels of cholinesterase. Dr. Johnson testified that he was familiar with the literature regarding organophosphate poisoning, but he could not recall any studies dealing only with diazinon and the long-term effects of diazinon exposure on humans.

Appellee also called Dr. Francis J. Waickman as an expert witness. Dr. Waickman's area of specialty is pediatrics, but he has taken postgraduate courses in many areas, including allergy, toxicology, and clinical immunology. He is board certified in pediatrics, allergy, clinical immunology, utilization review and quality assurance, and environmental medicine. Dr. Waickman evaluates and treats people who have chemical sensitivities and who have been exposed to pesticides. In his examination of appellee, Dr. Waickman found symptoms of central nervous system involvement. Specifically, Dr. Waickman found slow verbal responses and below normal reasoning and recall. Based on his examination, Dr. Waickman testified that appellee's problems are delayed neurotoxic effects from diazinon exposure. Dr. Waickman testified that he is familiar with the scientific literature regarding diazinon and organophosphates and he has no doubts that these chemicals can cause long-term effects on human beings.

Finally, appellee offered the testimony of Dr. Richard Austin, a clinical psychologist who has had experience treating people who have been poisoned by various chemicals. Dr. Austin personally examined and evaluated appellee, gave him a battery of psychological tests, reviewed the medical records of doctors who had treated appellee, elicited historical information from appellee's family and friends, and reviewed scientific literature regarding organophosphate poisoning. Dr. Austin concluded that appellee suffered nervous system damage resulting in emotional problems caused by the chemical poisoning in 1982. Dr. Austin was familiar with a study, admitted into evidence,

that was performed on behalf of the EPA by Drs. Savage, Keefe, and others, entitled "Chronic Neurological Sequelae of Acute Organophosphate Pesticide Poisoning." This study involved testing of individuals chronically exposed to a variety of pesticides, not including diazinon. Dr. Austin agreed that appellee suffers from many of the same impairments and exhibits similar test results to those discussed in the literature resulting from organophosphate poisoning. Dr. Austin testified that there are authoritative studies showing that organophosphate poisoning can cause delayed neurotoxic effects. The testimony regarding these studies indicated no conclusion that diazinon causes delayed neurotoxicity.

Unlike the expert in *Christophersen*, the expert witnesses here based their opinions on accurate underlying facts, such as estimation of the duration of appellee's exposure to diazinon. Thus, we turn to whether there was sufficient evidence supporting the experts' testimony that, in reasonable medical probability, diazinon caused the injuries alleged by appellee. *Brock* and *Christophersen* require that an expert's conclusions regarding causation rest upon a well-founded scientific methodology. *See Brock I*, 874 F.2d at 315; *Christophersen*, 939 F.2d at 1115. Appellee's experts all testified that they based their conclusions on past experience treating patients exposed to organophosphates and/or on published scientific studies showing a connection between exposure to organophosphates and delayed neurotoxicity. These experts admitted, however, that none of the published studies documented a connection between delayed neurotoxicity and exposure to diazinon. Only one study referenced by appellee's experts addressed diazinon and this study concerned a fatal ingestion of the pesticide and not whether a less than fatal exposure can cause delayed neurotoxicity. Testimony also indicated that the effects of exposure to compounds within a similar chemical class can vary widely.

Appellant presented the testimony of three doctors, Dr. Velma Campbell, Dr. Eric Comstock, and Dr. Francisco Perez. Dr. Campbell treated appellant in the emergency room at the New Orleans General Hospital. Campbell testified that some pesticides can cause delayed neurological symptoms, but that to her knowledge, diazinon is not one of these.

Dr. Perez is a clinical psychologist specializing in neuropsychology and behavioral medicine. Perez did not examine appellant, but

reviewed his medical and psychological records and reviewed the literature regarding organophosphates. Perez testified that a worsening of a patient's psychological condition is not a typical symptom caused by exposure to diazinon. Perez concluded, based on his review of the records and literature, that appellant's symptoms are most likely unrelated to the diazinon exposure.

Dr. Eric Comstock, a medical toxicologist, testified that he had experience treating persons exposed to toxic substances, 80-100 of which involved diazinon. Comstock also reviewed appellant's medical records and the literature about organophosphates, but did not examine appellant. Comstock agreed that appellant initially exhibited mild acute effects from the exposure, including eye irritation, slight weakness, diarrhea, headaches, and vomiting, but based on his experience and review of the records and literature, Comstock concluded that appellant has suffered no delayed effects related to the diazinon exposure.

Comstock testified that diazinon is an "unrestricted use" pesticide, which means that it does not cause or has not been shown to cause severe, impairing long-term effects. Comstock noted that his personal experience treating persons exposed to diazinon has not indicated that diazinon causes delayed neurotoxicity. Furthermore, Comstock testified that diazinon has been widely used by the public for many years and that, it if caused delayed neurotoxicity, this would have been identified. Finally, Comstock testified that none of the literature supports the conclusion that diazinon causes delayed neurotoxicity, and that there is literature concluding diazinon does not cause delayed neurotoxicity.[5]

Even if expert testimony rests upon a well-founded methodology, it will nevertheless be insufficient to support a finding of causation if the studies or tests fail to show a statistically significant relationship between exposure to the substance and the kind of injury alleged. *See Brock I*, 874 F.2d at 315; *Brock II*, 884 F.2d at 167. Although

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[5] Comstock specifically noted that the article entitled "Poisoning Due to Organophosphate Insecticides," (author unknown) concluded that diazinon, as well as certain other insecticides, did not produce neuropathy.

the studies relied upon by appellee's experts support a conclusion that certain pesticides falling within the organophosphate classification can cause delayed neurotoxicity, these studies do not establish any relationship, statistically significant or otherwise, between diazinon and delayed neurotoxicity. Absent a well-founded scientific methodology showing some connection between exposure to diazinon and the kind of injuries alleged by appellee, the conclusions of appellee's experts regarding causation were speculative and insufficient to enable the jury to make a reasonable inference as to causation. *See Brock I*, 874 F.2d at 315; *Brock II*, 884 F.2d at 167. Consequently, we sustain point of error one.

Having sustained this point of error, we need not address appellant's other points complaining of alleged errors which are not likely to arise on another trial. Appellee has filed a motion to strike the affidavit of Cindy Colvin, the court reporter in the trial court, and for further relief which relates to the argument under points of error five and six. In view of our disposition of this appeal, we need not rule on this motion.

We reverse the judgment and remand the cause for further proceedings consistent with this opinion.

Sam Roberston
Justice

Judgment rendered and Opinion filed December 31, 1992.
Panel consists of Justices Junell, Robertson, and Draughn. [Justice Draughn dissented without an opinion.]

APPENDIX H

NO. 83-42067

RICHARD ELLIS	§	IN THE DISTRICT COURT OF
	§	
VS.	§	HARRIS COUNTY, TEXAS
	§	
MARITIME OVERSEAS CORP.	§	165TH JUDICIAL DISTRICT

JUDGMENT

BE IT REMEMERED that on the 19th day of March, 1991, came on for trial the above entitled and numbered cause, after it had been duly set for trial on said date with due notice to all parties, and appeared Plaintiff, in person and with his attorneys of record and appeared Defendant, a corporation by and through its corporate representative and attorneys of record, all parties announced ready for trial. Thereafter, a panel of properly qualified jurors were interviewed, and questioned by voir dire by the attorneys representing the parties. Thereafter, the parties through their attorneys exercised their peremptory challenges, and a jury of twelve properly qualified jurors were duly selected and sworn in as the jury in this cause. Thereafter, the parties through their attorneys made their opening statements.

Thereafter, Plaintiff presented his evidence until he rested. Defendant presented its evidence until it rested. Thereafter, with the help and participation of the attorneys, the Court prepared a written charge with questions for the jury and thereafter permitted the attorneys to make their objections to the charge. Thereafter, the Court read its charge and questions in their entirety to the jury, and the parties were then permitted to present and make jury argument by and through their attorneys. Thereafter, the jurors were retired to deliberate their verdict. Thereafter, on the 12th day of April, 1991 the jury returned in open court and announced through its presiding juror, that the jury had reached a unanimous verdict on each and all of the questions. Thereafter, the Court read the jury's verdict aloud in open court in the presence of the jurors, the parties and their attorneys. No objection was made to the form or receipt of the verdict or to discharging the jury. Thus, the Court did receive the verdict and order that it be

filed among the papers of the cause and then did discharge the jury. Thereafter, upon written motion by Plaintiff, that a judgment be entered in favor of Plaintiff, the Court conducted a hearing and heard argument of counsel as to the form of the judgment that should be entered. In that regard, the Court considered the Plaintiff's request that the judgment also include prejudgment interest. The Court did find and determine that prejudgment interest should be awarded at the rate approved by the Texas Supreme Court in the *Cavnar* decision on the past damages only. The Court found no peculiar circumstances exist to deny prejudgment interest. The evidence and findings support a judgment in favor of Plaintiff under the Jones Act and doctrine of unseaworthiness under the general maritime and admiralty law. Since Plaintiff has the right and option to select the ground of recovery that supports the greater recovery, the recovery granted to Plaintiff by this judgment is based primarily upon the Jones Act and the general maritime and admiralty law which authorizes Plaintiff to recover prejudgment interest and also punitive damages in addition to actual damages. If, for any reason, it is ever ruled or decided that Plaintiff is not entitled to recover on this basis, this Court does additionally find and rule that Plaintiff is enitlted to recover under the Jones Act. Additionally, the jury findings support a recovery to Plaintiff for maintenance and cure and punitive damages because of Defendant's arbitrary and capricious failure to pay such maintenance and cure benefits to Plaintiff. The parties stipulated that the rate of maintenance would be $8.00 per day for the number of days since the Plaintiff left the services of the ship. At the stipulated rate, the maintenance presently owed to the Plaintiff would be $24,320.00. The amount of medical expenses to date which would be owed to the Plaintiff under the concept of "cure" is $38,000 as found by the jury for past medical expenses. The Court does grant the Plaintiff recovery for those amounts plus the $1,000,000.00 in punitive damages the jury found because of Defendant's arbitrary and capricious failure to pay those benefits. However, in fashioning this Judgment, the Court does not allow a double recovery regarding the monies for maintenance and cure. It is, therefore,

ORDERED, ADJUDGED and DECREED that Plaintiff recover of and from Defendant MARITIME OVERSEAS CORPORATION the sum of $12,447,728.00 consisting of $10,576,000.00 in actual

and punitive damages plus $1,871,728 as prejudgment interest, calculated at the rate of 10% compounded daily from the date of accrual of damages in the past found by the jury. It is, further

ORDERED, ADJUDGED and DECREED that to said recoveries [sic] to be added postjudgment interest at the rate of 10% until same is paid. It is, further,

ORDERED, ADJUDGED and DECREED that all costs of court are taxed against Defendant MARITIME OVERSEAS CORPORATION for which let execution issue if not timely paid. It is, further,

ORDERED, ADJUDGED and DECREED that Plaintiff is to have the right to writs of execution and all other rights and remedies allowed by law for the collection of judgment if this judgment be not timely paid. It is, further,

ORDERED, ADJUDGED and DECREED that all other relief not granted herein is denied such that this is a final judgment.

SIGNED this 29 [sic] day of April, 1991.

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JUDGE PRESIDING

APPENDIX I

NO. 83-42067

RICHARD ELLIS	§	IN THE DISTRICT COURT OF
VS.	§	HARRIS COUNTY, TEXAS
MARITIME OVERSEAS CORP.	§	165TH JUDICIAL DISTRICT

ORDER

BE IT REMEMBERED that on this day came on to be heard Defendant's Motion for New Trial. The Court after considering same, pleadings on file and argument of counsel is of the opinion that said Motion should be denied. It is, therefore,

ORDERED that Defendant's Motion for New Trial is hereby DENIED.

SIGNED this 17 day of July, 1991.

KEN HARRISON
JUDGE PRESIDING

APPENDIX J

STATUTES AND RULES INVOLVED

The Jones Act, 46 U.S.C. App. § 688(a):

Any seaman who shall suffer personal injury in the course of his employment may, at his election, maintain an action for damages at law, with the right of trial by jury, and in such action all statutes of the United States modifying or extending the common-law right or remedy in cases of personal injury to railway employees shall apply; and in case of the death of any seaman as a result of any such personal injury the personal representative of such seaman may maintain an action for damages at law with the right of trial by jury, and in such action all statutes of the United States conferring or regulating the right of action for death in the case of railway employees shall be applicable. Jurisdiction in such actions shall be under the court of the district in which the defendant employer resides or in which his principal office is located.

Federal Employers' Liability Act, § 1, 45 U.S.C. § 51:

Every common carrier by railroad while engaging in commerce between any of the several States or Territories, or between any of the States and Territories, or between the District of Columbia and any of the States or Territories, or between the District of Columbia or any of the States or Territories and any foreign nation or nations, shall be liable in damages to any person suffering injury while he is employed by such carrier in such commerce, or, in case of the death of such employee, or his or her personal representative, for the benefit of the surviving widow or husband and children of such employee; and, if none, then of such employee's parents; and, if none, then of the next of kin dependent upon such employee, for such injury or death resulting in whole or in part from the negligence of any of the officers, agents, or employees of such carrier, or by reason of any defect or insufficiency, due to its negligence, in its cars, engines, appliances, machinery, track, roadbed, works, boats, wharves, or other equipment. . . .

Federal Rule of Evidence 702:

TESTIMONY BY EXPERTS

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.

Texas Rule of Civil Evidence 702:

TESTIMONY BY EXPERTS

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education may testify thereto in the form of an opinion or otherwise.

Federal Rule of Evidence 703:

BASES OF OPINION
TESTIMONY BY EXPERTS

The facts or data in the particular case upon which an expert bases an opinion or inference may be those perceived by or made known to the expert at or before the hearing. If of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject, the facts or data need not be admissible in evidence.

Texas Rule of Civil Evidence 703:

BASES OF OPINION
TESTIMONY BY EXPERTS

The facts or data in the particular case upon which an expert

bases an opinion or inference may be those perceived by, reviewed by, or made known to the expert at or before the hearing. If of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject, the facts or data need not be admissible in evidence.

APPENDIX K

Pages 1-6, 7-8, and 11-16 of Petitioner's Motion for a New Trial, or in the Alternative, for Remittitur and Motion for Judgment Notwithstanding the Verdict, filed in the 165th Judicial District Court of Harris County, Texas (May 29, 1991):

[1] TO THE HONORABLE JUDGE OF SAID COURT:

COMES NOW Maritime Overseas Corporation, Defendant, with this its Motion for New Trial or, in the Alternative, for Remittitur, and would show unto this Honorable Court the following:

I.

This case was tried to a jury beginning March 18, 1991. On April 29, 1991, the Court entered a final judgment in this case.

II.

Defendant would show that it is entitled to a new trial because there is factually insufficient evidence to support the jury findings on damages (Question No. 6), on gross negligence (Question No. 7), on exemplary damages (Question No. 9), on whether Ellis reached maximum medical cure (Question No. 10), on whether Defendant acted arbitrarily or capriciously in failing to pay the required maintenance or cure (Question No. 12), and on the imposition of punitive [2] damages for failure to pay maintenance and cure (Question No. 13). Furthermore, the jury findings on the above described issues are against the great weight and preponderance of the evidence. Defendant would furthermore show that it is entitled to a new trial because the damages awarded (Questions No. 6, 9 and 13) are excessive. In the alternative, and without waiving its Motion for New Trial, Defendant would show that it is entitled to a remittitur.

Section I

THERE IS FACTUALLY INSUFFICIENT EVIDENCE TO SUPPORT THE JURY'S AWARD OF ACTUAL DAMAGES, AND SUCH AWARD IS AGAINST THE GREAT WEIGHT AND PREPONDERANCE OF THE EVIDENCE

A. The Award is Based on Speculative Evidence

Defendant does not dispute and has never disputed the fact that Plaintiff was exposed to diazinon on board the S/T OVERSEAS ALASKA and suffered some immediate, or acute effects of the exposure. Plaintiff's recovery of actual damages as set forth in all of the subparts of Question No. 6 must be predicated upon a determination by the jury that Plaintiff was permanently and totally disabled from the exposure to diazinon. Plaintiff produced testimony from a toxicologist and a number of healthcare providers to the Plaintiff, all of whom testified that Plaintiff suffered from chronic neurotoxicity as a result of the exposure, which neurotoxicity caused permanent physiological damage to the nervous system and secondary psychological problems. [3] All of the medical experts testified that Plaintiff would experience temporary effects from exposure to diazinon, which would resolve as the acetyl cholinestherase levels in the body returned to normal. Defendant concedes that Plaintiff is entitled to damages consistent with an exposure with short term effects. Defendant would assert, however, that there is insufficient evidence upon which the jury could make the determination of permanent disability or permanent injury and such determination would be against the great weight and preponderance of the evidence, thus all of the jury findings to each subpart of Question No. 6 have insufficient factual evidentiary support and are against the great weight and preponderance of the evidence.

The thrust of Plaintiff's expert testimony is: 1) Plaintiff was exposed to diazinon, which is an organophosphate; 2) some organophosphates have been shown to cause delayed neurotoxicity; 3) Ellis exhibits some of the symptoms associated with delayed neurotoxicity; 4) Ellis therefore has delayed neurotoxicity. Defendant would show that these conclusions by the experts are based on

speculation, which is insufficient to support the jury verdict.

It is has been held that opinion evidence is usually insufficient to establish a fact issue at trial. *Kiel v. Texas Employer's Insurance Association*, 679 S.W.2d 656, 658 (Tex. Ct. App.–Houston [lst Dist.] 1984, no writ). Opin[4]ion evidence based on conjecture lacks probative value and is simply a naked conclusion that will not support a jury finding, even if admitted without objection. *Golleher v. Herrera*, 651 S.W.2d 329, 334 (Tex. Ct. App.–Amarillo 1983, no writ); *see also, Maritime Overseas Corp. v. Thomas*, 681 S.W.2d 160, 162 (Tex. Ct. App.–Houston [14th Dist.] 1984, no writ).

The test whether an expert's testimony expresses reasonable probability as opposed to pure conjecture is not based on the semantics of the expert or the use of particular terms or phrases, but by looking at the entire substance of the expert's testimony. *Bufkin v. Texas Farm Bureau Mutual Insurance Co.*, 658 S.W.2d 317, 321 (Tex. Ct. App.–Tyler 1983, no writ).

Although diazinon is an organophosphate, it is considered one of the milder forms of organophosphate. Plaintiff's experts, in stating that Ellis had delayed neurotoxicity, relied on medical literature containing studies about the long term effects of certain organophosphates. Some of these studies concluded that some organophosphates could cause delayed neurotoxicity. None of the studies relied on by Plaintiff's experts, however, dealt with the long term effects of diazinon. Indeed some of the studies indicated that diazinon had not been found to cause any long term effects.

[5] It has been held by some courts that the lack of conclusive epidemiological proof can be fatal to a plaintiff's claim alleging toxic injury. In *Brock v. Merrell Dow Pharmaceuticals, Inc.*, 874 F.2d 307, 313 (5th Cir. 1989), modified at 884 F.2d 166 (5th Cir. 1989), the court found lack of conclusive epidemiological proof on humans to be fatal to the plaintiff's claim that the anti-nausea drug Bendectin caused birth defects. In *Viterbo v. Dow Chemical Co.*, 826 F.2d 420 (5th Cir. 1987), the court found that the testimony of Dr. Alfred Johnson, one of plaintiff's own witnesses in this case, was not of any probative value because, in part, there was no scientific evidence that the drug in issue caused the effects complained of in humans. In that case, rats had been exposed to a large amount of the substance, had developed cancerous tumors and died. The court found that

Dr. Johnson's reliance upon the rat study was unfounded. *Id.* at p. 423-424. The court also noted that the lack of objective evidence was heightened by the fact that the symptoms complained of by plaintiff could have a number of causes. *Id.* at 423. Indeed, the symptoms complained of by Ellis could have a number of causes.

Because the underlying proof relating to Ellis' current condition, which relates to causation of the damages awarded, is based on factually insufficient evidence and is against the great weight and preponderance of the evidence, [6] the jury findings as to all elements of damage should fail and Defendant should receive a new trial.

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[7] D. The Jury's Finding as to Medical Expenses to be Incurred in the Future is Based on Speculation and Thus there is Factually Insufficient Evidence to Support it and Such a Finding is Against the Great Weight and Preponderance of the Evidence

The jury found that Ellis would in reasonable probability incur medical expenses in the amount of $850,000 in the future (response to Question 6(d)). As stated above, this finding must flow from a determination by the jury that Ellis is permanently and totally disabled. In addition, the medical evidence upon which the jury made this determination is based on conjecture or speculation. There is thus factu[8]ally insufficient evidence to support the jury finding and such a finding is against the great weight and preponderance of the evidence.

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[11] VII.

THE DAMAGES AWARDED BY THE JURY ARE EXCESSIVE

A. The Actual Damages Awarded are Excessive.

Under Texas procedural law, the court should examine all evidence in the record to determine whether sufficient evidence supports a

damage award. *Pope v. Moore*, 711 S.W.2d 622, 624 (Tex. 1986). Defendant would point out, however, that this case is to be decided under federal law, that is the Jones Act and general maritime law. Defendant would assert that the state court can look to federal courts for an evaluation of whether damages are excessive. Even though the savings to suitor clause allows federal causes of action to be brought in state court, because of the federal interest in uniformity across the country and in both state and federal courts, the cases decided in federal courts should be controlling.

Under federal law, an award is excessive if the magnitude of the actual award is so exaggerated that it indicates bias, passion, prejudice, corruption or other improper motive. *Allen v. Seacoast Products, Inc.*, 623 F.2d 355, 364 (5th Cir. 1980). Federal courts have adopted the "maximum recovery rule." That is, a jury award is excessive if it exceeds the maximum recovery that any reasonable man could award. Any amount above that is appropriate for remittitur. *Pressey v. Patterson*, 898 F.2d 1018, 1024 (5th Cir. [12] 1990), *Caldarera v. Eastern Airlines, Inc.*, 705 F.2d 778, 784 (5th Cir. 1983).

Given the fact that there is insufficient evidence to support the jury finding of actual damages, and such finding is against the great weight and preponderance of the evidence (see argument above), the jury award of damages is excessive and should be set aside, entitling Defendant to a new trial. In the alternative, Defendant seeks a remittitur (see below).

For the reasons stated above, any award of damages to Plaintiff in excess of an award for temporary effects as a result of the exposure to diazinon are grossly excessive. Defendant would submit that thus any award over $100,000 would be excessive and Defendant should be granted a new trial if the award is not remitted to such a figure.

It is furthermore clear that even if Plaintiff has long term disability caused by the exposure to diazinon, the awards for loss of wage earning capacity and medical expenses have insufficient factual support in the evidence and are excessive. The remaining award for damages, specifically relating to pain and suffering, mental anguish and physical impairment, are clearly the result of bias, passion, prejudice, corruption or other improper motive and are greatly in excess of the amount that any reasonable man could feel the claimant is entitled to. Furthermore, there is factually [13] insufficient evidence to support these awards and such awards are against the great weight and preponderance of the evidence.

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VIII.

MOTION FOR REMITTITUR

In the alternative to Defendant's Motion for New Trial, Defendant seeks a remittitur. Under Texas procedure, if the court determines that the evidence is factually insufficient to support the damage awarded, then the court may order a [14] remittitur. *Pope v. Moore, supra.* The court may also determine what remittitur standard applied. *Id.* at p. 623. If the federal remittitur standard applies, the court may then remit to the maximum award that any reasonable man might impose.

For the reasons stated above, Defendant seeks a remittitur of the actual damages to $100,000 and remittitur of punitive damages, if allowed, to an amount that bears a reasonable relationship to the damages awarded. Defendant would show that at most Plaintiff would expect to experience the effects of exposure to diazinon for a matter of months. Plaintiff worked on the S/T OVERSEAS ALASKA until December, 1982, at which time he quit of his own accord. He would have been required to get off the ship because of union regulations within a very short period of time. Plaintiff did attempt to go back to sea during early to mid 1983. He did not do so, however, not because of any medical condition but because shipping was bad and he had difficulty getting a job. Plaintiff had no medical expenses during this time period that were not paid by the ship owner while he sought medical evaluation while on the ship. Thus there is virtually no claim for loss of wage earning capacity or loss of wages and no claim for medical expenses. Any physical impairment experienced by the Plaintiff was temporary and mental anguish and pain and suffering should also be tempo[15]rary. The absolute maximum amount that any reasonable man should award the Plaintiff under these circumstances is $100,000.

In the alternative, even assuming long term disability on the part of the Plaintiff, the other elements of damages should be remitted. Plaintiff's recovery for loss of wage earning capacity in the past should be reduced to $160,000 and his recovery for loss of wage earning capacity in the future should be reduced to $850,000, as these figures are based on Plaintiff's actual earnings and not speculative evidence

relating to a hypothetical able bodied seaman. The extent of medical expenses in the future should be remitted to $100,000 as any amount in addition to that would be entirely speculative. Plaintiff's condition should either get better or remain the same and not deteriorate and there is no basis for imposing an award for physical pain and mental anguish in the future over seventeen and a half times that amount awarded in the past and physical impairment in the future four times that awarded in the past. The recovery for future physical pain and mental anguish should be remitted to $228,000 and the award for physical impairment in the future should be remitted at $250,000.

[16] IX.

MOTION FOR JUDGMENT NOTWITHSTANDING THE VERDICT

In the alternative to the foregoing motions, Defendant would assert that it is entitled to a judgment in its favor as a matter of law. Specifically, Defendant would show that there is no evidence of probative force to support the jury finding as to damages as set forth in the answers to all of the jury subparts to Question No. 6. For reasons stated in Section I of the Motion for New Trial, the testimony by Plaintiff's experts is speculation and does not provide any probative value to support the jury finding on damages. As the finding of damages is critical to Plaintiff's recovery, Defendant seeks a judgment notwithstanding the verdict in its favor on Plaintiff's claim for damages.

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Pages 9-14 of Petitioner's Appellate Brief, filed in the Fourteenth Court of Appeals, Fourteenth District (Nov. 25, 1991):

[9] Appellant does not contest the damages resulting from appellee's short-term exposure to diazinon, which includes out-patient medical treatment in 1982 and the loss of two days of work. The jury's damage award, however, greatly exceeds those damages related to that exposure; the award instead is based upon appellee's claim of delayed neurotoxicity, an injury separate and distinct from that of mere

exposure. Appellee presented insufficient evidence to support the jury's award, because appellee did not prove to a reasonable medical probability that he suffers from *delayed neurotoxicity.*

Appellee's expert testimony is speculative and not based upon a reasonable medical probability because: (1) there is ***absolutely no scientific or medical evidence indicating that diazinon causes delayed neurotoxicity;*** (2) the scientific evidence uniformly indicates that ***delayed neurotoxicity manifests itself within a period of a few weeks,*** and not within a period of several *years*, as allegedly occurred in this case;[3] and (3) appellee's [10] objective test results are inconsistent with delayed neurotoxicity (*i.e.*, appellee's EEG, MRI, and CAT Scan are all normal).

A. Proof of the degree of an injury must be based upon a reasonable scientific probability.

A plaintiff in a toxic tort case can prevail only after proving that there is a reasonable medical probability that his injury resulted from his exposure to the toxic substance. *Gideon v. Johns-Manville Sales Corp.*, 761 F.2d 1129, 1137 (5th Cir. 1985). *See also Duff v. Yelin*, 721 S.W.2d 365, 370 (Tex. App.—Houston [1st Dist.] 1986), *affd*, 751 S.W.2d 175 (Tex. 1988). A plaintiff cannot establish a reasonable medical probability with evidence demonstrating only a statistical probability that his injury resulted from the toxic exposure, or with expert testimony that he *could* have contracted a disease by exposure to a toxic substance. *Thompson v. Southern Pac. Transp. Co.*, 809 F.2d 1167, 1169 (5th Cir.), *cert. denied*, 484 U.S. 819 (1987) (expert testimony indicated that while dioxin exposure *could* have caused appellee's disease, it was more likely caused by appellee's alcohol consumption).

In determining the sufficiency of an expert's testimony, courts look to the totality of that testimony, paying close attention to the

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[3] The doctor for the seaman's union declared Ellis fit for duty in March 1983 (S.F. 682-83) and in 1984, appellee medical records indicate that he suffered from ailments such as an upper respiratory infection (S.F. 902), and a cold and high blood pressure (S.F. 926-27).

sources of the expert's opinion. *Brock v. Merrell Dow Pharmaceuticals, Inc.*, 874 F.2d 307, 311 (5th Cir.) *modified*, 884 F.2d 167 (5th Cir. 1989), *cert. denied*, 110 S.Ct. 1511 (1990) ("Confronted as we now are, with difficult medical questions, courts must critically evaluate the reasoning process by which the experts connect data to their conclusions in order for courts to consistently and rationally resolve the issues before them."). Courts also scrutinize the expert's scientific methodology, rejecting as unreliable testimony based upon speculation or conjecture. *See Ochs v.* [11] *Martinez*, 789 S.W.2d 949, 958 (Tex. App.—San Antonio 1990, writ denied); *Duff v. Yelin*, 721 S.W.2d 365, 370 (Tex. App.—Houston [1st Dist.] 1986), *aff'd*, 751 S.W.2d 175 (1988); *Maritime Overseas Corp. v. Thomas*, 681 S.W.2d 160 (Tex. App.—Houston [14th Dist.] 1984, no writ).[4] An expert opinion is speculative, and thus lacking in probative value, if there is "no [scientifically] documented connection" between a plaintiff's illness and the toxic exposure. *Perry v. United States*, 755 F.2d 888, 893 (11th Cir. 1985). Moreover, "a connection [between a plaintiff's illness and the documented exposure] would have to be demonstrated by an epidemiological study before it could be conclusively proved in an individual case." *Id.; see also Brock*, 884 F.2d at 167.

B. Appellee failed to establish the degree of his injury to a reasonable scientific probability.

1. There is insufficient scientific evidence to prove that an acute exposure to diazinon can cause long-term effects in humans.

In determing whether appellee has proven by a reasonable scientific probability that he has developed delayed neurotoxicity, the

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[4] The issue of sufficiency of the evidence to support the judgment is distinguishable from the issues of admissibility under Tex. R. Evid 703. Appellant does not contest the admissibility of appellee's expert testimony, but rather attacks the reliability of the erroneous conclusions drawn by appellee's experts.

Court must examine the scientific evidence upon which appellee's experts based their conclusions. *Perry*, 755 F.2d at 893. *See also American Cyanamid Co. v. Frankson*, 732 S.W.2d 648, 656 (Tex. App.—Corpus Christi 1987, writ ref'd n.r.e.). Many of appellee's experts testified that they had relied upon medical literature on organophosphate exposure in arriving at their diagnoses.[5] [12] A review [of] that scientific literature, however, reveals that appellee's experts have no scientific support for their opinions, because (1) the literature does not demonstrate any link between diazinon exposure and delayed neurotoxicity, and (2) the scientific evidence, as well as the expert testimony, indicate that delayed neurotoxicity manifests itself within a few weeks after exposure, and not a couple of years, as in appellee's situation.[6]

First, appellee offered no epidemiological proof that diazinon can cause delayed neurotoxicity. *Brock* 884 F.2d at 313 ("We find, in this case, the lack of conclusive epidemiological proof to be fatal to [appellee's] case."). In fact, several articles state that only some, but not all, organophosphates cause delayed neurotoxicity.[7] Appellee's osteopath, Dr. Johnson, testified that he reviewed scientific literature

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[5] *See* testimony of Edward G. Ezrailson (S.F. 461-62), Alfred R. Johnson (osteopath) (S.F. 611), Dr. Francis Waickman (S.F. 780), and Richard Austin (S.F. 1132, 1161, 1240).

[6] Summaries of the testimony from the scientific articles upon which these witnesses relied appear in the Appendix to this Brief. For the Court's convenience, appellant refers to the scientific articles only by their respective numbers, as set forth in the Appendix. The articles' full citations appear in the Appendix.

[7] Article No. 2 (S.F. 521) lists fifteen chemicals as causing delayed neurotoxicity, but diazinon is not listed as a chemical that can cause delayed neurotoxicity. (S.F. 521) Article 3 considers psychiatric problems resulting from organophosphate exposure, and the article does not even mention diazinon. (S.F. 518) Article 4 considered a study with rats, and diazinon was not used as a test chemical to study delayed neurotoxicity. (S.F. 512) Article 5 stated *explicitly* that

on delayed neurotoxicity due to organophosphate exposure, and he could not recall any studies dealing with diazinon. (S.F. 613) The scientific articles upon which the experts rely specifically link [13] diazinon *only* to short-term exposure, and *not* to delayed neurotoxicity. (See Articles 2, 4, 5, 9, 10, 13, 14, 15 and 16.) None of this scientific literature suggests that diazinon causes delayed neurotoxicity; in fact, Article 5 affirmatively *exonerates* diazinon: "parathion, paraoxon, chlorothion, demeton, dichlorvos, ***diazinon,*** phosphamidon, and trichlorphon did not produce neuropathy [or delayed neurotoxicity]." (S.F. 1909) This scientific evidence demonstrates conclusively that there is no documented connection between diazinon and delayed neurotoxicity.[8] *See Perry,* 755 F.2d at 893.

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diazinon does not cause delayed neurotoxicity. (S.F. 1909) Article 8 indicates that only certain organophosphates cause delayed neurotoxicity, but did not list diazinon as one of those chemicals. (S.F. 494, 1889) Article 9 lists six chemicals as causing delayed neurotoxicity, and diazinon is not listed.(S.F. 519-20) Article 10, an EPA study, involved case studies of delayed neurotoxicity, but none of the case studies involved diazinon. (S.F. 1227, 1892) Article 13 did not list diazinon as one of the chemicals causing delayed neurotoxicity. (S.F. 507) Article 14 considered a woman who committed suicide by ingestion of diazinon and by cutting her own wrists, and not delayed neurotoxicity. (S.F. 516) Article 15 stated that cessation of exposure to diazinon "normally results in complete recovery." (S.F. 488)

[8] Ezrailson, appellee's biochemist, testified that he relied specifically on the following articles: No. 1 (S.F. 513); No. 3 (S.F. 517); No. 7 (S.F. 507); No. 8 (S.F. 489) [sic]; No. 4 (S.F. 510-511); No. 5 (S.F. 521); No. 6 (S.F. 508); No. 7 (S.F. 507); No. 8 (S.F. 489); No. 9 (S.F. 518); No. 11 (S.F. 522); No. 12 (S.F. 496); No. 13 (S.F. 487, 533-54); No. 14 (S.F. 516); No. 15 (S.F. 477). Ezrailson could not, and did, not testify that any of these articles link diazinon in particular to delayed neurotoxicity. Drs. Comstock and Perez, as well as Austin, relied on Article No. 10 (Plaintiff's Exhibit No. 72) (S.F. 1862, 1892, 1364, 1160, 1222), which did not link diazinon

As the medical literature indicates, appellee's experts could not point to ***one single article linking diazinon to delayed neurotoxicity.*** Appellant does not contest that appellee suffered the short-lasting effects from short-term organophosphate exposure, but this injury is simply not the same as . . . delayed neurotoxicity. Because there is no scientific evidence upon which an expert could conclude that diazinon causes delayed neurotoxicity, appellee's damages must be limited to those resulting from short-term [14] exposure.

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Pages 2-7 of Petitioner's Reply Brief, filed in the Fourteenth Court of Appeals, Fourteenth District (May 22, 1992):

[2] Appellee's citations to the record do no more than establish Maritime Overseas's two main points in its opening brief—(1) that appellee's experts did not establish that diazinon exposure causes "delayed neurotoxicity," and (2) that the evidence in the record is insufficient to prove that appellee suffers from "delayed neurotoxicity," because [3] there is no evidence of onset of his neurotoxicity symptoms until months or years after his exposure.

1. Maritime Overseas argues the weight, not the admissibility of the evidence.

Appellee first implies that Maritime Overseas has no basis for an appeal because it never objected to appellee's experts or to their testimony. Appellee, however, fails to recognize that any witness who meets the basic requirements of Rule 702 of the Texas Rules of Civil Evidence may testify concerning his or her knowledge. Appellee made that *prima facie* showing for all of his experts.

Entirely distinct from the question whether an expert may testify is the question whether appellee carried his burden of proving

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exposure to delayed neurotoxicity. Dr. Comstock also relied on Articles No. 5, 6, 7, and 8 (S.F. 1909, 1872, 1893, 1883). Dr. Perez also relied on Article No. 8 (S.F. 1496-97).

his case at trial. There must be sufficient evidence of a reasonable medical probability that the injuries described resulted from exposure to the toxic substance. *Gideon v. Johns-Manville Sales Corp.*, 761 F.2d 1129, 1137 (5th Cir. 1985); *Duff v. Yelin*, 721 S.W.2d 365, 370 (Tex. App.—Houston [1st Dist.] 1986), *aff'd*, 751 S.W.2d 175 (Tex. 1988). The proper method for preserving error when the evidence is insufficient to support the verdict is to file motions for new trial and for remittitur. Tex. R. Civ. P. 324(b). Maritime Overseas filed both motions with the trial court (Tr. 44-61) and thus preserved the error.

"[C]ourts must critically evaluate the reasoning process by which the experts connect data to their conclusions in order for courts to consistently and rationally resolve the disputes before them." *Brock v. Merrell Dow Pharmaceuticals, Inc.*, 874 F.2d 307, 310 (5th Cir.), *modified*, 884 F.2d 166 (5th Cir. 1989) (*Brock II*), *cert. denied*, 494 U.S. 1046 (1990). *Brock* and its progeny set forth the federal common law with respect to toxic tort [4] cases. Although appellee points to *Brock II* and suggests that it has lowered the standard of proof in toxic tort cases, this is what *Brock II* requires:

> [W]e find, in this case, the Brocks' *failure to present statistically significant epidemiological proof* that Bendectin causes limb reduction defects *to be fatal to their case.*
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> . . . .
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> Hopefully, our decision will have the effect of encouraging district judges faced with medical and epidemiologic proof in subsequent toxic tort cases to be *especially vigilant in scrutinizing the basis, reasoning, and statistical significance of studies presented by both sides.*

884 F.2d at 167 (emphasis added). The Fifth Circuit in *Brock II* adopted the remainder of its earlier opinion. The court adhered to its holding that the evidence in that case was insufficient to support the jury's verdict. *Id.*

Appellee tries to escape a review of the sufficiency of his evidence by citing *Christophersen v. Allied-Signal Corp.*, 902 F.2d 362 (5th

Cir. 1990), on rehearing, 939 F.2d 1106 (5th Cir. 1991) (en banc) (*Christophersen II*), for the proposition that the causation requirement in a toxic tort case has been reduced. *Christophersen* was a *summary judgment* case in which the Fifth Circuit *affirmed en banc* the defendant's motion for summary judgment, granted on the basis that the *plaintiff's expert testimony was insufficiently reliable and more prejudicial than probative. See id.* The Fifth Circuit held that the plaintiff expert's testimony that twenty years of exposure to nickel and cadmium caused plaintiff's injury was "'of such little weight . . . that [the] testimony would not actually assist the jury in arriving at an intelligent and sound verdict.' " *Id.* at 1113 (quoting *Viterbo v. Dow Chemical Co.*, 826 F.2d 420, 422 (5th Cir. 1987)).

[5] In holding that unreliable scientific evidence does not even have to go to the jury, *Christophersen II*, if anything requires more stringent proof of causation than that in *Brock*.[2] As such, *Christophersen II* supports Maritime Overseas's position. It allows that a jury in most instances is to consider the questions "relating to the bases and sources of an expert's opinion," but requires that the bases and sources of an opinion be such that they support the jury's verdict. *See id.* at 1109.

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[6] Appellee relies on cases that do not support his position that an objection must be made. *Jones v. LaFargue*, 758 S.W.2d 320, 327 (Tex. App.–Houston [14th Dist.] 1988, writ denied), was a factual insufficiency case in which this Court held that an abnormal EEG and degenerative changes in the brain, health, and behavior supported a medical diagnosis of dementia and the jury's finding of lack of testamentary capacity. *LaFargue* said absolutely nothing about requiring a party to object to the admissibility of expert testimony to preserve an insufficiency point–instead this Court painstakingly reviewed the record and detailed the facts sufficient to support the

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[2] Maritime Overseas did not cite *Christophersen II* in its opening brief because it dealt primarily with admissibility under the Federal Rules of Evidence, not a review of the factual sufficiency of the evidence.

jury's verdict.

The second case cited by appellee, *Galtney v. Underwood Neuhaus & Co.*, 700 S.W.2d 602, 604 (Tex. App.—Houston [14th Dist.] 1985, no writ), did not involve a review of the factual sufficiency of the evidence, but was an appeal to contest a temporary injuction. The appellant maintained on appeal that that trial court had erred in not allowing it to call additional adverse witnesses. This Court held that the point was waived for failure to properly object to the trial court's ruling.

Maritime Overseas is asserting a different error—that the evidence was insufficient to support the verdict. That point was properly preserved. Appellee's "waiver" assertion, therefore, lacks merit.

2. Appellee's experts failed to prove that diazinon causes delayed neurotoxicity.

Appellee's brief discusses delayed neurotoxicity caused by "organophosphate" poisoning, dodging the lack of evidence to support the conclusion that *diazinon* causes delayed neurotoxicity. Appellee asserts that that evidence is sufficient to demonstrate that [7] diazinon can cause delayed neurotoxicity based on the concept that *some* organophosphates can cause delayed neurotoxicity. The scientific articles introduced by appellee and relied on by his experts plainly state that some members of the organophosphate family can cause delayed neurotoxicity and others do not. Appellee's analogy to a "rose by any other name" ignores the commonly understood scientific principle that members of the same chemical family often have markedly different properties.[4]

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[4] For example, carbon dioxide (CO_2) and carbon monoxide (CO) differ only by one oxygen atom, yet one is part of the air we breathe and one is deadly if inhaled by humans. Similarly, Isopropyl Alcohol (C_3H_7OH) (rubbing alcohol) is much more dangerous and potentially lethal if ingested than its chemical sister Ethyl Alcohol (C_2H_5OH) (drinking alcohol).

Pages 4-6 of Petitioner's Reply to Respondent's Response to Petitioner's Post-Submission Memorandum, filed in the Fourteenth Court of Appeals, Fourteenth District (Sept. 1, 1992):

[4] *Christophersen* [*v. Allied Signal Corp.* 939 F.2d 1106 (5th Cir.) *cert. denied*, 503 U.S. 912 (1992)] held that an expert witness's testimony should be disregarded for summary judgment purposes when that testimony is not based on sound methodology. *Id.* at 1115. The *Christophersen* court, acknowledging that evidence of the sources and bases of an expert's opinion should generally be presented to the jury, held that the expert's testimony in that case would not assist the trier of fact and thus need not have been even submitted to the jury. *Id.* at 1116. *Christophersen* imposes a very stringent causation standard indeed, because it allows a trial judge to ignore expert testimony in evaluating a case on summary judgment. *Christophersen* provides no basis for appellee's contention that the careful sufficiency review—which always has been conducted by the Fifth Circuit when causation is based on expert testimony—has been diluted in any way. To the contrary, *Christophersen* holds that expert testimony must have some mettle even before it can go to a jury. Surely, then, expert testimony must meet that mettle on appellate review.

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[5] **2. Appellee Misconstrues the Effect of the Jones Act on the Applicable Causation Standard.**

Appellee finally concedes that this is a Jones Act case "pure and simple," but misapprehends the effect of the Jones Act's "slight negligence" standard.[4] In arguing that the Jones Act also imposes a reduced burden of proof on causation, appellee blurs the concepts of contributory and comparative negligence, as discussed in *Rogers*

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[4] Thus, appellee finally admits what he previously had denied in his Appellee's Brief: that the Jones Act provided the basis for his recovery. *Compare* Appellee's Brief at 38 ("Our Judgment is Based on the General Maritime Law, Not the Jones Act.") Appellee, therefore, necessarily concedes that he is not entitled to an award of prejudgment interest, as prejudgment interest may not be awarded in case where

v. Missouri Pacific Railroad Co., 352 U.S. 500, 506-08 (1957), with those involved with the proof that a defendant's negligence was the cause in fact of the plaintiff's injury. *Rogers* stands for the proposition that, under the Jones Act, liability is to be imposed on an employer if the "negligence of the employer played any part in the [employee's] injury or death." *Id.* at 507. Thus, *Rogers* and the Jones Act have the effect of eliminating an employer's common law defenses, including contributory negligence. *Id.* at 506 & n.12. Nothing in *Rogers*, however [6] suggests that a plaintiff bears a reduced burden of showing that the employer's negligence was a cause of the plaintiff's injury.

A number of decisions have discussed the interplay between the Jones Act's reduced negligence standard and a plaintiff's obligation to prove causation. In *Chisholm v. Sabine Towing & Transp. Co. Inc.*, 679 F.2d 60, 62 (5th Cir. 1982), the Fifth Circuit acknowledged that under the Jones Act the defendant "must bear responsibility if his negligence played any part, even the slightest, in producing the injury." *Id.* The court also noted that the Jones Act eliminates the defense of contributory negligence. *Id.* Significantly, the court then stated that "[n]othing that has been said impairs the principle that in Jones Act cases, cause, in fact, is still a necessary ingredient of liability." *Id.* Similary, another court explained that just because the Jones Act removed the defense of contributory negligence "does not mean . . . that defendant's fault must not be shown to be *a* cause – there must, of course, be a connection – it merely need not be *the* cause." *Peymann v. Perini Corp.*, 507 F.2d 1318, 1324 (1st Cir. 1974) (emphasis in the original), *cert. denied*, 421 U.S. 914 (1975).

Thus, although the Jones Act imposes liability on a defendant regardless of the *percentage* of his fault, it does not, as demonstrated in *Chisholm* and *Peymann*, alter a plaintiff's common law burden of proving the link between a defendant's actions and the alleged injury. To meet this burden, appellee was required to present sufficient evidence that diazinon causes delayed neurotoxicity. Because appellee has failed to do so, this Court should grant a new trial.

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recovery is even partially based on the Jones Act. *Maritime Overseas Corp. v. Narvaez*, 728 S.W.2d 924, 926 (Tex. App. – Houston [1st Dist.] 1987, no writ).

Pages 19-23 of Petitioner's Post-Submission Brief, filed in the Fourteenth Court of Appeals of Texas, Fourteenth District (Apr. 26, 1993):

[19] **D. Appellate Courts May Review Jones Act Damage Awards for Factual Sufficiency.**

Appellate courts may review damage awards in Jones Act cases for factual sufficiency. As the Texas Supreme Court held in *Sweet v. Port Terminal Railroad Association*, 653 S.W.2d 291 (Tex. 1983), there can be no doubt that the court of appeals has the power to order a remittitur in Federal Employers' Liability Act ("FELA") actions. *Id.* at 295-96. *See also, [sic] Missouri Pacific R.R. Co. v. Kimbrell*, 334 S.W.2d 283, 287 (Tex. 1960) (court of civil appeals may order a remittitur in FELA cases). As recognized by appellee, the same legal standards that apply in FELA cases also apply to Jones Act cases. Significantly, "the proper remittitur standard is factual sufficiency." *Pope v. Moore*, 711 S.W.2d 622, 624 (Tex. 1986). Thus, this Court may review the factual sufficiency of the damage award in this case.

Apppellee claims that after the United States Supreme Court's decision in *Deen v. Hickman*, 358 U.S. 57 (1958), any review of a jury verdict by Texas appellate courts for factual sufficiency is precluded in FELA (and thus Jones Act) cases. Appellee's claim, however, ignores both the prior and subsequent history in the *Deen* cases. On appeal from a judgment in favor of Deen, the court of appeals reversed, *see* 275 S.W.2d 529, and the Texas Supreme Court denied writ. On appeal to the United States Supreme Court, that [20] Court reversed the decision of the court of civil appeals, holding that the proof offered at trial "justified with reason the jury's conclusion that employer negligence played a part in producing the petitioner's injury." *Deen v. Gulf, Colorado & Santa Fe Ry. Co.*, 353 U.S. 925 (1957).

Upon remand, the court of civil appeals found the damages to be unsupported by the evidence and remitted them by $5,500. *Gulf Colorado & Santa Fe Ry. Co. v. Deen*, 306 S.W.2d 171, 174 (Tex. Civ. App.—Eastland 1957). The Texas Supreme Court affirmed the remittitur, observing that remittitur "is essentially but a part of the power to order a new trial and thus does not usurp the jury function of assessing damages." *Gulf, Colo. & Santa Fe Ry. Co. v. Deen*,

312 S.W.2d 933, 942 (Tex. 1958) (*Deen I*). Moreover, the Texas Supreme Court found "nothing in the [FELA] or in the decisions of the Supreme Court of the United States purporting to negative the power of the state courts thus to require a remittitur . . . and certainly nothing in the decision of the Supreme Court in the instant case purporting to inhibit the action." *Id.* The Supreme Court then issued the opinion cited by appellee. On further reivew, the Texas Supreme Court *reaffirmed* its holding on the remittitur, observing that "the Supreme Court of the United States conspicuously forbears to disturb this part of our decision." *Gulf, Colo. & Santa Fe Ry. Co. v. Deen*, 317 S.W.2d 913, 914 (Tex. 1958), *cert. denied* 359 U.S. 945 (1959).[14]

Appellee's reliance on *Sentilles v. Inter-Caribbean Shipping Corp.*, 361 U.S. 107 [21] (1959), is similarly misplaced. [15] In *Sentilles*, the Supreme Court reviewed the appellate court's *rendition* of a judgment based upon that court's legal determination that *no evidence* supported the jury's verdict. The Supreme Court found that the court of appeals had erred in determining that there was no evidence to support the verdict. Thus, the Court simply found that the plaintiff's expert's testimony constituted more than "no evidence." The Court did not in any way prohibit reviewing courts from evaluating the factual sufficiency of evidence. In fact, the Court stated that

> [t]he focal point of judicial review is in the reasonableness of the particular inference or conclusion drawn by the jury. * * * Courts are not free to reweigh the evidence and set aside the jury verdict merely because the jury could have drawn different

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[14] In fact, the United States Supreme Court denied *certiorari* in both *Deen I* and *Deen II* on this issue. *See Deen v. Gulf, Colo. & Santa Fe Ry. Co.*, 358 U.S. 874 (1958); *Deen v. Gulf, Colo. & Santa Fe Ry. Co.*, 359 U.S. 945 (1959).

[15] Contrary to appellee's assertion at oral argument, the plaintiff in *Sentilles* did not claim that he developed tuberculosis from a fall. After falling and being washed several feet by a wave, he experienced an immediate reactivation of his latent tuberculosis.

> inferences or conclusions or because judges feel that other results are more reasonable. * * * The proofs here justified with reason the conclusion of the jury that the accident caused the petitioner's serious subsequent illness.

Id. at 110 (citations omitted). This language is virtually identical to that employed by the Texas Supreme Court in a variety of opinions discussing the standard of review in factual sufficiency cases, including *Pool v. Ford Motor Co.*, 715 S.W.2d 629, 634 (Tex. 1986) ("courts are not free to reweigh the evidence and set aside a jury verdict merely because the judges feel that a different result is more reasonable").

Moreover, although the Jones Act imposes upon plaintiffs a reduced, "slight evidence" burden in proving a defendant's *liability*, [footnote omitted] it does *not* relieve plaintiff of the burden of proving damages by a preponderance of the evidence. [22] Appellee acknowledged this legal proposition by submitting a jury issue inquiring about damages based upon the preponderance of the evidence. (Tr. 16)[17] Only on appeal did appellee begin to assert that he had to produce only "slight evidence" of his damages. The authorities he has cited do not support his position.

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[17] In submitting the question in this manner, appellee has waived any argument that a "slight evidence" standard applies to this Court's review of damages. *See General Chemical Corp. v. De La Lastra*, No. D-1799, 1993 WL 46530 (Tex. Feb. 24, 1993). . . . In that case, the Texas Supreme Court unanimously held that the application of substantive maritime law can be waived if a jury issue is not appropriately submitted under that law. Specifically, the Court held that a party may not request at trial "the very issues that it now [on appeal] seeks to avoid." *Id.* at *3. In this case, appellee submitted his damages issue to the jury based on a "preponderance of the evidence" standard. (Tr. 16) To the extent that appellee asserts that the Jones Act provides a burden of proof different from the one he submitted to the jury, the point has been waived under *De La Lastra*. Moreover, as discussed in this and earlier briefing to this Court, the evidence is insufficient to support this damages award under any standard – state or federal.

For example, he cites *Hines v. Consolidated Rail Corp.*, 926 F.2d 262 (3d Cir. 1991), asserting that so long as an expert expresses an "opinion" that the damages in question resulted from a particular source, that opinion, regardless of its basis, constitutes sufficient evidence of damages. A careful reading of *Hines*, however, reveals that it says nothing of the sort. Hines was a railroad worker who alleged that he contracted bladder cancer and other ailments because of his exposure to PCBs and possibly other toxic chemicals at his workplace. The trial court granted summary judgment to the defendant. The Third Circuit reversed, holding that the trial court had improperly excluded the evidence of plaintiff's only medical expert. 926 F.2d at 276. The court noted that if the [23] expert's testimony was admitted, it *could* be sufficient for the plaintiff to survive a summary judgment. The appellate court reasoned further, however, that if the district court, after properly assessing the expert's testimony and the basis for it, found that the expert's testimony lacked support on causation or other critical issues such that no genuine issue of material fact remained, the district court was free to grant summary judgment for the defendants under appropriate FELA standards. *Id.* Furthermore, the appellate court noted that, in forming his opinion, the expert had used traditional methods, including consideration of scientific literature that indicated that PCBs were carcinogenic. *Id.* at 274.

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Pages 1-3 of Petitioner's Response to Respondent's Submission of Authorities, filed in the Fourteenth Court of Appeals, Fourteenth District (July 9, 1993):

Appellee has provided the Court with a copy of the United States Supreme Court's recent opinion in *Daubert v. Merrell Dow Pharmaceuticals*, ____ U.S. ____ (June 28, 1993) (1993 WL 224478), along with a cover letter stating that it would "support" appellee's position in this case. When read, however, that case does exactly the opposite.

In *Daubert*, the Supreme Court held that scientific expert testimony must be "more than subjective belief or unsupported speculation." (slip op. at 6). Such testimony [2] must be grounded

"in the methods or procedures of science." *Id.* The Court further concluded that: "In order to qualify as "scientific knowledge," an inference or assertion must be derived by the scientific method. Proposed testimony must be supported by appropriate validation." *Id.* Moreover, the court observed that "conventional devices"–such as weighing to determine whether "evidence presented supporting a position is insufficient to allow a reasonable juror to conclude that the position more likely than not is true"–are the appropriate safeguards in reviewing expert testimony. *Id.* at p. 8.

In that case, the petitioner had presented a number of scientific studies to support his theory that a particular drug caused birth defects. The Supreme Court presented general guidelines to be used in evaluating whether such studies are reliable evidence: whether the theory can be (and has been) tested; whether it has been subjected to peer review or publication; the known or potential rate of error; the existence of a control standard; and general acceptance in the scientific community. *Id.* at 7-8. The Court then remanded the case for a determination as to whether the plaintiffs' studies met those guidelines.[1]

In this case, however, the guidelines are inapplicable, *because appellee* presented *not one scientific study of any kind whatever* which demonstrates that diazinon is linked with delayed neurotoxicity. *Daugert* supports Maritime Overseas' position: appellee did not present sufficient evidence to support his damages verdict, because he presented no [3] expert testimony based on "reliable and valid" scientific evidence to support the verdict. *See id.* at 7.

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[1] *Daubert* was an appeal from a summary judgment and thus did not determine whether plaintiff's evidence, even if admissible, would be sufficient to support the verdict. The *Daubert* court, however, plainly envisioned that some admissible expert testimony would be insufficient to support a verdict. *Id.* at 7-8.

Pages 8-16 and 17-21 of Petitioner's Application for Writ of Error, filed in the Texas Supreme Court (Oct. 3, 1994):

[8] [T]his case does not involve a dispute over the admissibility of expert testimony. Rather, it involves the determination of the appropriate standards to be used in a Jones Act case in reviewing the sufficiency of expert testimony to support a verdict. This Court must choose between (1) the controlling federal [9] precedent articulated in *Brock v. Merrell Dow Pharmaceuticals, Inc.* 874 F.2d 307 (5th Cir.), *modified in part*, 884 F.2d 166 (5th Cir. 1989) ("*Brock II*"), *cert. denied*, 110 S. Ct. 1511 (1990), and discussed in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 113 S. Ct. 2786, 2798 (1993), under which an expert's testimony must be based on a reasonable scientific methodology to constitute sufficient evidence of a damage award, *see Brock*, 874 F.2d at 310-11, and (2) the standard applied by the court of appeals, in which an expert's mere conclusions, regardless of their bases, will suffice to sustain a damage award.

As the dissenting opinion by Justice Robertson straightforwardly demonstrates, the expert testimony upon which the actual damage award of $8,573,000.00 is based is not grounded in *any* well-founded scientific methodology.[6] Had the court of appeals used the proper standard in reviewing testimony, it would have concluded, as a panel of the Court of Appeals did, that the evidence was insufficient to support the actual damages award. As such, this case should be remanded to the trial court for a new trial on damages.

A. The Applicable Federal Standard: *Brock* and *Daubert*.

The court of appeals correctly held that, in a Jones Act case, questions of sufficiency of the evidence are controlled by federal law.

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[6] Maritime does not dispute that Ellis's evidence was sufficient to support the conclusion that diazinon exposure can cause discrete, short term effects resulting in some injury to Ellis. The evidence, however, is insufficient to support the conclusion that the diazinon exposure causes delayed neurotoxicity, from which Ellis claims he now suffers.

(Slip Op. at 5); *see also Texaco Ref. & Mktg., Inc. v. Estate of Dau Van Tran*, 808 S.W.2d 61, 64 (Tex.), *cert. denied*, 112 S. Ct. 301 (1991). *See Miles v. Apex Marine Corp.*, 111 S. Ct. 317, 324 (1990) ("[T]he Jones Act establishes a uniform system of seamen's tort law."). The court, however, applied the wrong federal standard in weighing the sufficiency of Ellis's damages evidence.

[10] A plaintiff in a toxic tort case can prevail only after proving that there is a reasonable medical probability that his injury resulted from his exposure to the toxic substance. *Gideon v. Johns-Manville Sales Corp.*, 761 F.2d 1129, 1137 (5th Cir. 1985). *See also Duff v. Yelin*, 721 S.W.2d 365, 370 (Tex. App.—Houston [1st Dist] 1986), *aff'd*, 751 S.W.2d 175 (Tex. 1988). A plaintiff cannot establish a reasonable medical probability with evidence demonstrating only a statistical probability that his injury resulted from the toxic exposure. *Thompson v. Southern Pac. Transp. Co.*, 809 F.2d 1167, 1169 (5th Cir.), *cert. denied*, 484 U.S. 819 (1987) (expert testimony indicated that while dioxin exposure could have caused appellee's disease, it was more likely caused by appellee's alcohol consumption).

In determining the sufficiency of an expert's testimony, courts look to the totality of that testimony, paying close attention to the sources of the expert's opinion. *Brock*, 874 F.2d at 311. Courts also scrutinize the expert's scientific methodology, rejecting as unreliable testimony based upon speculation or conjecture. *See Ochs v. Martinez*, 789 S.W.2d 949, 958 (Tex. App.—San Antonio 1990, writ denied); *Duff*, 721 S.W.2d at 370; *Maritime Overseas Corp. v. Thomas*, 681 S.W.2d 160 (Tex. App.—Houston [14th Dist.] 1984, no writ).[7] An expert opinion is speculative, and thus lacking in probative value, if there is "no [scientifically] documented connection" between a plaintiff's illness and the toxic exposure. *Perry v. United States*, 755 F.2d 888, 893 (11th Cir. 1985). Moreover, "a connection [between a plaintiff's illness and the documented exposure] would have to be

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[7] The issue of sufficiency of the evidence to support the judgment is distinguishable from the issues of admissibility under Tex. R. Evid. 703. Petitioner does not contest before this Court the admissibility of appellee's expert testimony, but rather attacks the reliability of the erroneous conclusions drawn by Ellis's experts.

demonstrated by an epidemiological study before it could be conclusively proved in an individual case." *Id.* at 893. The standards [11] governing the review of expert testimony have been plainly articulated by the Fifth Circuit in *Brock*, 874 F.2d at 308-11, again in *Brock II*, 884 F.2d at 167, and by the United States Supreme Court in *Daubert*, 113 S. Ct. at 2798 (1993).

In *Brock*, the Fifth Circuit stated that "[c]ourts must critically evaluate the reasoning process by which the experts connect data to their conclusions in order for courts to consistently and retaionally resolve the disputes before them." *Brock*, 874 F.2d at 310. Thus, in cases involving complicated medical issues, appellate courts should not "accept uncritically any sort of opinion espoused by an expert merely because his credentials render him qualified to testify." *Id.* at 311 (quoting *Richardson by Richardson v. Richardson-Merrell, Inc.*, 857 F.2d 823, 829 (D.C. Cir. 1988), *cert. denied*, 493 U.S. 882 (1989)).[8] Thus, the Fifth Circuit concluded that:

> [W]e find, in this case, the Brocks' *failure to present statistically significant epidemiological proof* that Bendectin causes limb reduction defects *to be fatal to their case.*
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> . . . .

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[8] The Fifth Circuit also has adopted a stringent test for considering the admissibility of an expert's testimony. *Christophersen v. Allied-Signal Corp.*, 902 F.2d 362 (5th Cir. 1990) *on rehearing*, 939 F.2d 1106 (5th Cir. 1991) (en banc) (*Christophersen II*), *cert. denied*, 112 S. Ct. 1280 (1992). *Christophersen* was a summary judgment case in which the Fifth Circuit affirmed the defendant's motion for summary judgment, granted on the basis that the *plaintiff's expert testimony was insufficiently reliable and more prejudicial than probative. See Christophersen II*, 939 F.2d at 1113. The Fifth Circuit held that the plaintiff expert's testimony that twenty years of exposure to nickel and cadmium caused plaintiff's injury was "of such little weight . . . that [the] testimony would not actually assist the jury in arriving at an intelligent and sound verdict.' " *Id.* at 1113 (quoting *Viterbo v. Dow Chem. Co.*, 826 F.2d 420, 422 (5th Cir. 1987)).

> Hopefully, our decision will have the effect of encouraging district judges faced with medical and epidemiologic proof in subsequent toxic tort cases to be *especially vigilant in scrutinizing* [12] *the basis, reasoning, and statistical significance of studies presented by both sides.*

Brock II, 884 F.2d at 167 (emphasis added). The United States Supreme Court specifically approved *Brock's* rationale for evaluating the sufficiency of expert testimony in *Daubert*. *Daubert*, 113 S. Ct. at 2798.

In addition to epidemiological testing, courts evaluating whether a theory is based on well-founded scientific methodology should look to whether the "theory or technique has been subjected to peer review and publication," the known and potential rates of error in the technique applied, and "the existence and maintenancne of standards controlling the technique's operation." *Daubert*, 113 S. Ct. at 2797. A court also should consider the extent to which the expert's methodology has gained "general acceptance" in the scientific community. *Id.*

In this case, Ellis offered *no* epidemiological study, *no* peer-reviewed theory, *nor any* evidence of general scientific acceptance to support the conclusion of his experts that his exposure to diazinon caused delayed neurotoxicity. The premise upon which his experts' conclusion was based—that because some organophosphates can cause delayed neurotoxicity, diazinon therefore must cause delayed neurotoxicity—is false logic, as pointed out by Justice Robertson's concurring and dissenting opinion, because *some* organophosphates *do not* cause delayed neurotoxicity. (Concurring and Dissenting Slip Op. at 9) *See* discussion *infra* pp. 16-18.

B. *Brock* and *Daubert* Apply to Jones Act Cases.

A majority of the court of appeals wrongly concluded that *Brock* and *Daubert* do not apply to Jones Act cases. To apply the standards articulated in *Brock* and *Daubert* in [13] a Jones Act case, the majority theorized, would have required it to ignore *Sentilles v. Inter-Caribbean Shipping Corp.*, 361 U.S. 107 (1959). It is apparent, however, that *Brock's* and *Daubert's* scope encompasses *any* federal case involving expert testimony, *including* Jones Act cases. For

example, the Ninth Circuit recently applied *Daubert* to evaluate expert testimony in a Federal Employers' Liability Act ("FELA") case.[9] *Claar v. Burlington N.R.R. Co.*, 29 F.3d 499 (9th Cir. 1994). As shown by *Claar*, when federal law controls, the standards articulated in *Brock* and *Daubert* provide the proper standard of appellate review. Contrary to the court of appeals' reasoning, *Brock* and *Daubert require* that courts apply a "scientific methodology standard" in Jones Act cases.

The slight negligence burden in Jones Act cases does not, as the court of appeals appears to assume, obviate the need for appellate review of expert testimony. Simply put, expert testimony on the cause of damages in Jones Act cases cannot be based wholly on faulty syllogisms. *See Claar*, 29 F.3d at 504. In *Claar*, the Ninth Circuit rejected the plaintiffs' contention that they had satisfied the minimal standard used in FELA and Jones Act cases "by establishing that they were exposed to some chemicals that can cause some of the injuries they complain of, and affirmed the district court's conclusion that plaintiffs' experts failed to demonstrate a causal connection, required before letting the case go to the jury." *Id.* The court held that "FELA [and Jones Act] plaintiffs still must demonstrate ***some causal connection*** between a defendant's negligence and their injuries." *Id.* at 503 (emphasis added). Ellis's [14] experts, although *concluding* that diazinon caused Ellis's alleged delayed neurotoxicity, never offered any *basis* for this critical causal connection.

Moreover, contrary to the court of appeals' holding, applying *Brock* and *Daubert* to Jones Act cases does not require any departure from *Sentilles*, nor does *Sentilles* alter the burdens of proof in Jones Act cases under *Brock's* and *Daubert's* mandate. A comparison between *Sentilles* and this case reveals that, while the result in *Sentilles* would survive *Brock's* and *Daubert's* analysis, the result in this case cannot.

In *Sentilles*, three experts testified that trauma could aggravate latent tuberculosis and that, in their opinion, the trauma suffered by the plaintiff could have been the factor aggravating plaintif's condition. *Inter-Caribbean Shipping Corp. v. Sentilles*, 256 F.2d 156, 157-58

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[9] FELA and Jones Act cases are governed by the same standards, and the Jones Act incorporates FELA by reference. *See* 46 U.S.C. § 688 (1988); 45 U.S.C. § 51, *et. seq.* (1988); *Miles*, 111 S. Ct. at 324.

(5th Cir. 1958), *rev'd*, 361 U.S. 107 (1959). There was no dispute that trauma *could* aggravate latent tuberculosis. *Id.* Nor was there any dispute over whether the experts in question had applied well-founded scientific methodologies. Rather, *Sentilles* focused on the fact that the plaintiff's experts could not rule out the plaintiff's *diabetes* as another potential cause of plaintiff's injury. *Sentilles*, 361 U.S. at 109. The Supreme Court in *Sentilles* held that a jury could reasonably conclude from the experts' testimony that the trauma, rather than the diabetes, caused the plaintiff's illness. *Id.* at 110. Thus, *Sentilles* did not concern a faulty *methodology* applied by a plaintiff's expert, but instead focused on disputed *conclusions* reached by the experts.

Brock and *Daubert* require courts to inquire into an expert's *methodology*. *Daubert*, 113 S. Ct. at 2797; *Brock*, 874 F.2d at 310. Thus, an expert's *conclusions* are not the primary focus of a court's review. Rather, the court must examine the *underlying scientific technique*. *Id.* Nothing in *Sentilles* runs contrary to this approach. The *en banc* court of [15] appeals applied an inappropriate standard, choosing to defer to the expert conclusions, even though those *conclusions* were not based on any *sound methodology*.[10] If Ellis had presented sufficient evidence, based on well-founded scientific methodologies, that diazinon exposure can caused delayed neurotoxicity, then the case

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[10] The court of appeals observed in passing that Maritime levied no objection to the admissibility of Ellis's expert witnesses. Any expert, however, who meets the basic requirements of Rule 702 may testify regarding his or her knowledge. Ellis arguably made this *prima facie* showing. Entirely distinct from the question of whether an expert may testify, however, is the question of whether Ellis carried his burden of proving his case at trial. There must be sufficient evidence of a reasonable medical probability that the injuries described resulted from exposure to the toxic substance. *Gideon*, 761 F.2d at 1137; *Duff*, 721 S.W.2d at 370. The proper method for preserving error when the evidence is insufficient to support the verdict is to file motions for new trial and for remittitur. Tex. R. Civ. P. 324(b). Maritime Overseas filed both motions with the trial court (Tr. 44-61), and thus preserved the error.

would resemble *Sentilles*, in that the jury could have reasonably considered whether diazinon or Ellis's alcohol abuse was the cause of Ellis's alleged condition. Ellis's evidence, however, is insufficient to support even the initial premise that diazinon causes delayed neurotoxicity, a showing necessary to sustain the damages award.

C. No Reasonable Scientific Methodology Was Used in This Case.

The court of appeals' failure to apply *Daubert* and *Brock* to this case constituted harmful error. The court of appeals' own review of Ellis's expert tesitimony reveals that Ellis's experts used no scientific methodology at all. Rather, the central, and scientifically inaccurate, premise of Ellis's causation argument is that because some organophosphates, the family of chemical compounds to which diazinon belongs, caused delayed neurotoxicity, diazinon must cause delayed neurotoxicity.

Ellis's rationale runs contrary to *all* commonly understood scientific principles. "Organophosphate" is a broad chemical family name that encompasses a diverse group of compounds. For example, ATP (adenine triphosphate) is also an organophosphate. However, [16] ATP is naturally occurring in the human body, and relatively large amounts of ATP are essential for our metabolism and energy production. (*See* Concurring and Dissenting Opinion at 9.) Exposure to ATP certainly does not cause neurotoxicity; however, under Ellis's rationale, simply because ATP is an organophosphate and scientific studies have linked some organophosphates to neurotoxicity, ATP must also be linked to neurotoxicity. Obviously, Ellis's rationale is fatally flawed. *See id.*

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[17] D. Under Both Federal and Texas Law, the Court of Appeals Reached the Wrong Conclusions.

Significantly, at trial Ellis did not urge the application of the "featherweight" negligence standard – the standard applied by the court of appeals to Ellis's damages; not until appeal did he suggest that he

should be relieved of the burden of proving his damages by a preponderance of the evidence. Even under the improper standard employed by the court of appeals, however, the trial court's actual damage award cannot stand because there is *not even featherweight evidence* that diazinon causes delayed neurotoxicity. Moreover, the court of appeals rejected the Corpus Christi court's analysis that requires a more detailed review of [18] Ellis's expert testimony under Texas law. (Slip Op. at 9) Thus, under any standard, the court of appeals reached the wrong result.

1. Ellis Waived Any Argument that the Featherweight Negligence Standard Applied to Ellis's Burden of Proving His Damages.

Although the Jones Act imposes upon plaintiffs a reduced, "slight evidence" burden in proving a defendant's *liability*, it does *not* relieve plaintiff of the burden of proving *damages* by a preponderance of the evidence. The court of appeals erred in applying the "slight" negligence standard in reviewing the actual damage award.

Ellis himself acknowledged this legal proposition by submitting a jury issue inquiring about damages based upon the preponderance of the evidence. (Tr. 16) Only on appeal did he begin to assert that he had to produce only "slight evidence" of his damages. . . .

[19] 2. Courts Review the Sufficiency of Evidence of Damages in Jones Act Case.

The court of appeals relied on inapplicable authority, namely *Ferguson v. Moore-McCormack Lines, Inc.*, 352 U.S. 521 (1957), and *Rogers v. Missouri Pacific Railroad*, 352 U.S. 500 (1957), for the proposition that a reduced burden of proof applies to negligence and causation in Jones Act cases. Decided together, *Rogers* discusses liability in a Federal Employer's Liability Act ("FELA") case and *Ferguson* in a Jones Act case. Neither opinion is on point.[11] *Daubert*

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[11] The question in *Ferguson* was whether the defendant has been negligent at all by failing to provide the proper tool for serving frozen ice cream. *Ferguson*, 352 U.S. at 523. *Ferguson* does not speak to

and *Brock* provide the standard for proving that exposure to a toxic substance resulted in delayed injury. *See also Maritime Overseas Corp. v. Thomas*, 681 S.W.2d 160, 162 (Tex. Ap.—Houston [14th Dist.] 1984, no writ) (expert testimony without a factual basis is "without probative value").

In fact, neither the Texas nor the federal courts afford special sanctity to jury awards of damages in FELA and Jones Act cases. Contrary to Ellis's assertions and the court of appeals' implicit conclusion, both Texas and federal appellate courts have reviewed trial courts' judgments for factual sufficiency of the damages in those cases. For example, in *Sweet v. Port Terminal Railroad Ass'n*, 653 S.W.2d 291, 295 (Tex. 1983) a FELA case, this Court recognized that "questions as to the excessiveness of damages are *questions of fact* made [20] final in the court of appeals." In *Nairn v. National Railroad Passenger Corp.*, 837 F.2d 565, 566 (2nd Cir. 1988), a FELA case, the court held that "[i]n order to determine whether a district court abused its discretion by refusing to order a new trial on damages, ***the appellate court must make its own 'detailed appraisal of the evidence bearing on damages.'"*** *Id.* at 567 (quoting *Grunenthal v. Long Island R.R.*, 393 U.S. 156, 159 (1968)) (emphasis added). After reviewing the evidence, the court (1) noted that "appellate courts have become increasingly willing to review damage awards," (2) vacated the judgment, and, (3) remanded the case for a new trial on the issue of damages. *Id.* at 568.[12]

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the proof required for asserting the degree of injury because it was clear the plaintiff severed two fingers using a knife to serve ice cream. *Id.* at 522-23. Similarly, *Rogers* did not involve a dispute requiring advanced scientific analysis. In *Rogers*, the employee was required to burn weeds with a hand torch at the side of railroad tracks. *Rogers*, 352. U.S. at 502. A passing train fanned the flames from the burning weeds causing the employee to jump back on loose and sloping gravel, resulting in the employee's injury. *Id.* at 502-03. The dispute was over whether the employee's or employer's negligence caused the injury, not over *whether* the plaintiff's injury resulted from the incident.

[12] Similarly, in *Knight v. Texaco, Inc.*, 786 F.2d 1296 (5th Cir. 1986),

As the cases demonstrate, the federal and Texas appellate courts have no difficulty reviewing *damage* awards for sufficiency and excessiveness using traditional standards of review, and not the slight negligence approach, in FELA and Jones Act cases. Thus, the court of appeals misapplied the standards of reviewing damages in a Jones Act case.

[21] As shown in Section C, *supra*, Ellis's experts failed to ever point to any proof that diazinon can cause delayed neurotoxicity. Thereorfe, there was ***no*** evidence that the long-term conditions Ellis claims he suffers from were caused by delayed neurotoxcity. Thus, there was no evidence of some of Ellis's damages. Under any standard of proof, Ellis failed to prove his damages.

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the court reviewed an award of damages in a Jones Act case. *Id.* 1298-99. The court noted that the proper standard for reviewing a district court's failure to grant a new trial on damages—the same issue raised by Maritime Overseas on this appeal—was whether the trial court abused its discretion, the same standard that the court of appeals should have applied in this case. *Id.* at 1299; (Slip Op. at 3). *See also Book v. Nordrill, Inc.*, 826 F.2d 1457, 1462 (5th Cir. 1987) (using standard expressed in language similar to that employed by this Court: "abuse of discretion" (quoting *Young v. City of New Orleans*, 751 F.2d 794, 798 (5th Cir. 1985)). Likewise, in a Jones Act case in which the excessiveness of a damage award was raised, the Fifth Circuit noted that even though there was sufficient evidence and a Seventh Amendment basis to preclude a directed verdict or jugment n.o.v., the court could, after weighing all the evidence, either grant a new trial or remittitur. *Jenkins v. Aquatic Contractors & Eng'rs*, 446 F.2d 520, 522 (5th Cir. 1971). In other words, even if a legal insufficiency attack—no evidence—would fail, the court should still employ a factual insufficiency analysis. Like the procedure adopted in Texas, the court should analyze the evidence and independently determine the maximum amount the jury could reasonably have awarded and then eliminate the excess by either ordering a remittitur or granting a new trial. *Id. See also Gautreaux v. Insurance Co. of N. Am.*, 811 F.2d 908 (5th Cir. 1987); *De Centeno v. Gulf Fleet Crews, Inc.*, 798 F.2d 138 (5th Cir. 1986).

Pages 5-7 of Petitioner's Reply to Respondent's Response to Petitioner's Supplemental Brief, filed in The Texas Supreme Court (Aug. 15, 1995):

[5] **II. THE JONES ACT DOES NOT DISPEL A PLAINTIFF'S BURDEN TO PROVE DAMAGES AND AN APPELLATE COURT'S OBLIGATION TO REVIEW THE DAMAGES AWARD; MOREOVER, ELLIS WAIVED ANY FEATHERWEIGHT STANDARD IN SUBMITTING THE DAMAGES ISSUE TO THE JURY BASED ON THE PREPONDERANCE OF THE EVIDENCE.**

The appropriate appellate review in this case was the review conducted by the original panel of the court of appeals: whether Ellis offered sufficient evidence, based on well-founded scientific methodology, to support over $8.6 million in actual damages. The panel properly concluded that the evidence was not sufficient. Ellis again urges that this standard of review—well-settled by federal court decisions in *Brock* and *Daubert*, and now adopted by this Court in *Robinson*—be cast aside because this is a Jones Act case. (Resp. br. at 8) Although this issue has been thoroughly briefed by both parties, Ellis raises it again because this Court's opinion in *Robinson* and the *en banc* court of appeals' opinion in this case cannot be reconciled. Ellis's "slight negligence" argument is without merit for two reasons: First, it is plain that damages awards in Jones Act cases are reviewable under the standards set forth in *Brock* and *Daubert*. Second, Ellis ignores the fact that the very damages issue he submitted to the jury asked it to base its award upon a "preponderance of the evidence," not "slight evidence." Tr. at 16.

[6] Ellis ignores the fact that traditional standards of review apply to the evaluation of the sufficiency of the damages in Jones Act cases. As discussed extensively in Maritime's earlier briefing to this Court, while liability may be established by slight evidence, both Texas and Federal courts have consistently reviewed the sufficiency of the damages awards in Jones Act and FELA cases.[4] In particular, the

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[4] *See, e.g., Sweet*, 653 S.W.2d at 294; *Nairn v. National Railroad*

Ninth Circuit has specifically held that expert testimony in Jones Act/FELA cases is subject to *Daubert* scrutiny, regardless of the slight negligence standard employed in Jones Act cases. *Claar v. Burlington N.R.R. Co.*, 29 F.3d 499, 503 (9th Cir. 1994).[5] In this case, however, the court of appeals adopted Ellis's view of the Jones Act and failed to review the sufficiency of Ellis's damages evidence under the proper standard, thus committing reversible error.[6]

Ellis himself recognized that the traditional analysis of damages is used in Jones Act cases. Ellis in fact offered the damages issue to the jury based on a preponderance of the evidence standard. (Tr. 16) At trial, Ellis did not suggest that the question failed to incorporate the slight evidence standard that he now claims applies to the appellate review of the damages verdict in this case. Ellis rather asserted that a different standard applied until this case was [7] appealed. Ellis thus failed to secure appropriate jury instructions and waived his "featherweight" argument. *See General Chemical Corp. v. Del La Lastra*, 852 S.W.2d 916, 920 (Tex.), *cert. dism'd*, 114 S. Ct. 490 (1993).

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Passenger Corp., 837 F.2d 565, 566 (2d Cir. 1988) ("[i]n order to determine whether a district court abused its discretion by refusing to order a new trial on damages, the appellate court must make its own 'detailed appraisal of the evidence bearing on damages.' ") (quoting *Grunethal v. Long Island R.R.*, 393 U.S. 156, 159 (1968)).

[5] Jones Act and FELA cases are governed by the same standards. *See* 46 U.S.C. § 688 (1988); 45 U.S.C. § 51, *et seq.* (1988); *Miles v. Apex Marine Corp.*, 498 U.S. 19, 32 (1990).

[6] Ellis's reliance on *Ricardo N., Inc. v. Argueta*, ____ S.W.2d ____, 38 Tex. Sup. Ct. J. 726, 731 (June 8, 1995), is misplaced. In that case, this Court reviewed Jones Act liability for a seaman who drowned and concluded that the plaintiffs *failed* to meet their burden of establishing negilgence even under the Jones Act slight negligence standard. The Court properly concluded that even proof of liability is subject to review under the Jones Act.

Pages 5-7 of Petitioner's Post Argument Brief, filed in the Texas Supreme Court (Dec. 4, 1997):

[5] During argument, Respondent asserted that the Jones Act prohibits factual sufficiency review. Texas authorities interpreting the Jones Act, however, have held directly to the contrary. *See, e.g., Broughton Offshore Drilling, Inc. v. Gaspard,* 1997 Tex. App. LEXIS 3336 (Tex. App.—Houston [1st Dist.] 1997, n.w.h.) (Jones Act case) ("In reviewing the factual sufficiency of the evidence, we examine all of the evidence."): *Downen v. Texas Gulf Shrimp Co.*, 846 S.W.2d 506 (Tex. App.—Corpus Christi 1993, writ denied) (Jones Act case) ("When we review a point of error complaining that a jury finding is against the great weight and preponderance of the evidence, we examine the record to determine if there is some evidence to support the finding and, if so, then determine whether the finding was either so contrary to the overwhelming weight and preponderance of the evidence as to be clearly wrong and manifestly unjust or that the great preponderance of the evidence supports its nonexistence."); *Machado v. George R. Brown Partnership,* 1993 Tex. App. LEXIS 1855 (Tex. App.—Houston [14th Dist.] 1993, no writ) (Jones Act case) (same); *Reviea v. Marine Drilling Co.*, 800 S.W.2d (Tex. App.—Corpus Christi 1990, writ denied) (Jones Act case) (same). *See also Moreno v. Texas Gulf Shrimp Co.*, 1997 Tex. App. LEXIS 1731 (Tex. App.—Corpus Christi 1997, n.w.h.) (Jones Act case) (holding that because appellant did not obtain a complete or agreed statement of facts, he could not discharge his burden to show that judgment was erroneous; therefore, "a presumption exists that the omitted evidence supports the judgment.").

Moreover, the Supreme Court has noted that when "wholesale exclusion" of scientific expert testimony is inappropriate—as when a plaintiff like Ellis is entitled to put on evidence of minor, short-term injury—and the evidence is admitted, "a review of its sufficiency is not foreclosed." *See* [6] *Havner,* 1997 Tex. LEXIS 67, *19 (referring to *Daubert* and legal sufficiency review).

Contrary to Respondent's position at oral argument, Jones Act plaintiffs *are* required to prove their injuries. Nothing in the language of the Jones Act or F.E.L.A., which the Jones Act incorporates by

reference,[3] suggests otherwise. In fact, neither statute dictates the method of proof of damages, the standard for appellate review of damage awards, or the standard for weighing expert testimony. As such, appellate courts should look to common law to determine (1) the burden a Jones Act plaintiff bears in proving his damages; and (2) the standard for appellate review of the factual sufficiency of damages evidence. This is made clear by the United States Supreme Court's recent decision in *Metro-North Commuter Railroad Co. v. Buckley*, 117 S. Ct. 2113 (1997), a F.E.L.A. case.

In *Buckley*, the court looked to *state common law* in deciding not to allow a cause of action for negligent infliction of emotional distress without proof of specific physical injury. *See id.* at 2116-2121 (listing a number of state cases involving claims of emotional distress and noting that "common law courts have denied recovery to those who, like Buckley, are disease and symptom free.").[4] In reaching this conclusion, the Court held that—unless the text of the statute *expressly rejects* application of common law—common law should be given "great weight," and courts are to be informed by "reference to the evolving common law." *Id.* at 2117 (emphasis added) (citing *Atchison, Topeka, Santa Fe Railway Co. v. Buell*, 480 U.S. 557 (1987)).

[7] Thus, according to the dictates of *Buckley*, this Court should be "informed by reference to the evolving common law" in determining the standards for weighing expert testimony and reviewing the factual sufficiency of damages evidence. *Id.* In other words, this Court should employ the standards announced in *Daubert*, *Robinson*, and *Havner* as guidance and should give those standards a "significant role" in the outcome of this case. *See id.* In doing so, the Court will not contravene the Jones Act's "humanitarian" purpose because, as the Supreme Court noted,

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[3] F.E.L.A. and the Jones Act are construed analogously. 46 U.S.C. § 688(a); *Miles v. Apex Marine Corp.*, 498 U.S. 19 (1990).

[4] Significantly, the Court's opinion does not contain a single mention of the "featherweight" burden of proof.

> [J]ust as courts must interpret [F.E.L.A.] to take proper account of the harms suffered by a sympathetic individual plaintiff, so they must consider the general impact, on workers as well as employers, of the general liability rules they would thereby ceate. Here the relevant question concerns not simply recovery in an individual case, but the consequences and effects of a rule of law that would permit that recovery. ***And if the common law concludes that a legal rule permitting recovery here, from a tort law perspective, and despite benefits in some individual cases, would on balance cause more harm than good, and if we find that judgment reasonable, we cannot find that conclusion inconsistent with F.E.L.A.'s humanitarian purpose.***

Id. at 2121 (emphasis added). Allowing a Jones Act plaintiff to recover more than eight million dollars for an injury that has not been proved by competent evidence is not consistent with any legitimate purpose or policy of the Jones Act.

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Pages 12-14 of Petitioner's Motion for Rehearing, filed in the Texas Supreme Court (May 1, 1998):

[12] In finding that the court of appeals employed the proper standard in its review of Ellis's damages evidence, this Court necessarily has concluded that Jones Act plaintiffs escape the requirements of *Daubert*, *Robinson*, and *Havner*. Maritime respectfully submits that the Court should reconsider its conclusion, as nothing in the Jones Act requires that scientific principles be discounted or ignored by a reviewing court. Scientific evidence mandates scrutiny even when a toxic mishap occurs at sea. Diazinon is diazinon wherever it is encountered. Likewise, diazinon either causes delayed neurotoxicity or it does not, wherever it is encountered. Such properties are not malleable.

While the majority opinion correctly states that "courts of appeal must apply the less stringent federal standard of review" when considering the merits of an appeal of a Jones Act or F.E.L.A. case, the Court overlooks the following admonition of the United States

Supreme Court in *Rogers v. Missouri Pac. R.R. Co.*, the seminal F.E.L.A. case:

> [O]nce certiorari is granted, *the fact that the case arises under the Federal Employers' Liability Act cannot in any wise justify a failure on our part to afford the litigants the same measure of review on the merits as in every other case.*

352 U.S. 500, 509 (1957) (emphasis supplied).

Moreover, the chief concern expressed by the Supreme Court in *Rogers* was that reviewing [13] courts should not invade the province of the jury on the issue of a Jones Act or F.E.L.A. employer's *liability*. *Id.* at 505-508. Maritime never has disputed its liability for Ellis's exposure to diazinon and the damages associated with that brief, acute exposure. Rather, it disputes today, as it has disputed for the past seven years, the nature and scope of Ellis's injuries as a result of the exposure. There is absolutely nothing in the Jones Act, F.E.L.A., or in the cases interpreting these statutes, that precludes a reviewing court's analysis of the evidence purporting to support Ellis's injuries.

Maritime's point on this issue is amply borne out by the Supreme Court's more recent decision in *Metro-North Commuter R.R. Co. v. Buckley*, 117 S. Ct. 2113 (1997), which is not cited by the majority, but which demonstrates unequivocally that plaintiffs in F.E.L.A. and Jones Act cases are not relieved of proving their injuries. In fact, the Court disposed of *Buckley*—an asbestos exposure case brought under F.E.L.A.—with absolutely no mention of the "featherweight" standard of negligence *or* causation. Rather, in considering whether the plaintiff could recover for negligently-inflicted emotional distress, the Court relied on *state common-law principles* that were not expressly excluded in the text of the statute. This aspect of *Buckley* illustrates that the majority is thus correct when it states that "a Texas court of appeals may not conduct a traditional factual sufficiency review of a jury's *liability* finding under the Texas 'weight and preponderance' standard," *see Ellis*, slip op. at 7 [App. A-6] (emphasis supplied), because such a review is expressly excluded by the text of the statute. Conversely, because the statute is silent as to the appropriate standard of review for a jury's assessment of damages, state common law principles

dictate the standards to be used by a reviewing court. *See Buckley,* 117 S.Ct. at 2116-18.

In summary, the fact that Ellis is a Jones Act plaintiff in no way relieves him from proving the causal nexus between his exposure to diazinon and his alleged damages:

> Every common carrier by railroad, . . . shall be liable in damages to any person suffering injury while he is employed by such carrier . . . , *for* [14] ***such injury or death resulting in whole or in part from the negligence of any of the officers, agents, or employees of such carrier*** . . . .

45 U.S.C. §51 (F.E.L.A.)[4] (emphasis supplied); *see also Buckley,* 117 S. Ct. at 2117 ("[Liability under the Act rests upon 'negligence' . . . .") (quoting *Consolidated Rail Corp. v. Gottshall,* 512 U.S. 532, 543 (1994)); *Ellis v. Union Pacific Rail Co.*, 329 U.S. 649, 653 (1947).

Thus, a F.E.L.A. plaintiff–and, by analogy, a Jones Act plaintiff–"still must demonstrate some causal connection between a defendant's negligence and [his] injuries." *Claar v. Burlington N.R.R. Co.*, 29 F.3d 499, 503 (9th Cir. 1994); *Mayhew v. Bell S.S. Co.*, 917 F.2d 961, 964 (6th Cir. 1990); *Edmonds v. Illinois Cent. Gulf. R.R.*, 910 F.2d 1284, 1288 (5th Cir. 1990); *Moody v. Maine R.R. Co.*, 823 F.2d 693, 695 (1st Cir. 1987). There is *absolutely nothing* in F.E.L.A. or Jones Act law that exempts Ellis from this requirement. *See Thompson v. Southern Pacific Trans. Co.*, 809 F.2d 1167, 1168 (5th Cir. 1987) ("[W]e find a lack of substantial evidence to support the verdict, for [plaintiff] did not introduce sufficient evidence at trial to *establish a link of causation between his alleged exposure to dioxin . . . and the development of his porphyria.*") (emphasis supplied). Put succinctly, "[F.E.L.A.] does not make the railroad the insurer for all employee injuries," and "the sky is simply not the limit

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[4] The standards of liability and proof are the same under the Jones Act and F.E.L.A. *In re Hechinger,* 890 F.2d 202, 208 (9th Cir. 1989), *cert. denied,* 498 U.S. 848 (1990).

for jury verdicts." *Buckley*, 117 S. Ct. at 2117 (quoting *Gottshall*, 512 U.S. at 543); *De Centeno v. Gulf Fleet Crews, Inc.*, 798 F.2d 138, 141 (5th Cir. 1986) (holding that jury award for seaman-decedent's pain and suffering was excessive and remanding for new trial).

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